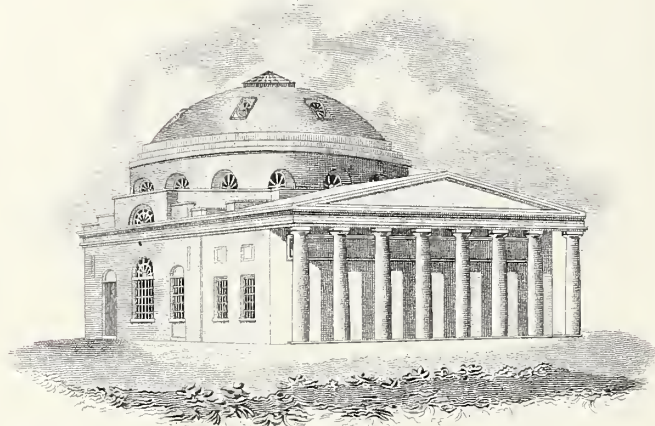


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No. 1

THE CARE OF AUTOMOBILE INJURIES INVOLVING THE FACE*

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Rochester, Minnesota

IN recent years, motor accidents have become so common that nearly every clinician, whether internist, surgeon, or specialist, is called upon in one capacity or another to treat patients who have been injured in automobile accidents. When such traumatic wounds involve the face, the effects of treatment are usually of particular interest to the patient, since in this region the esthetic outcome is as significant to him as is the functional result. The more or less popular opinion that the majority of traumatic facial injuries which are vital neither to the life of the patient nor to the functions of the body are inconsequential and therefore deserving of little immediate consideration is a misconception. On the contrary, it has been our experience that many patients are so concerned with post-traumatic deformities of the face that emotional disturbances develop. In short, the end-results of the surgical management of facial injuries affect not only the final appearance of the part involved but ultimately the patient's mental and emotional processes as well. This fact bears emphasis and should stimulate the surgeon to give every primary facial wound, no matter how insignificant, careful attention in an effort to prevent or minimize subsequent disfigurement.

A complete discussion of the care of automobile injuries involving the soft and bony tissues of the face is entirely too broad a topic to consider in these few pages. In consequence, we are forced to disregard technic and details for those general principles which we have found

useful and essential in the treatment of such injuries. Furthermore, it is well to remember that no amount of minute elaboration can alter the fundamental character of these principles. It is true that a great many of these injuries require some form of individual consideration and a few necessitate the construction of special appliances. However, without a knowledge of the underlying principles which govern the treatment of automobile injuries of the face, it is certain that the surgical management not only will usually be ineffective but also will continually become less inviting.

The care of automobile injuries of the face may be divided into primary and secondary treatment. The former refers to the initial wound; the latter, to facial deformities which may follow the original injury. We are confident that the immediate repair of traumatic wounds of the face is distinctly advantageous. It stimulates prompt healing, limits the degree of inflammatory reaction and, in turn, minimizes the subsequent scarring. However, early treatment does not infer the employment of hasty or careless time-saving methods which some surgeons seem to regard as emergency measures. No doubt many facial deformities and subsequent plastic operations could be avoided if more care and time were given to the treatment of the primary injury. It is safe to say that the more time spent in precise execution of each detail of surgical technic, the more pleasing will be the ultimate result.

In certain cases, it is neither possible nor always advisable to care for the wounds immediately (Figs. 1a and 2a). Treatment of serious

*From the Section on Laryngology, Oral and Plastic Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Annual Meeting of the Minnesota State Medical Society, Minneapolis, Minnesota, June 1, 1939.

and complicated fractures of facial bones, in which there is much displacement of the fragments, is preferably postponed until satisfactory roentgenograms can be secured; if the fractures involve the jaws, dental roentgenograms and dental plaster of paris study models are frequently necessary as well. Only with such accessory diagnostic agencies and only after a great deal of preoperative planning can one accurately determine the best method of reducing the fractures and immobilizing the fragments. A patient who is in shock should be put to bed and surgical intervention, other than such measures as are necessary to control bleeding, should not be instituted until his condition improves. There also are those cases in which the general condition of the patient is so critical, owing to associated injuries or to a fracture of the skull, that it is not in accordance with good judgment to attempt any type of immediate treatment of the facial wounds. However, if possible, the soft tissue injuries should receive attention within a few hours after the accident, while management of any fractures of the facial bones is better deferred indefinitely.

In cases in which there are lacerations about the face, hydrogen peroxide is a most effective agent for the removal of débris and coagulated blood; it leaves the injured tissues clean and fresh. The ultimate formation of scar tissue in any wound is always diminished by sharp excision of ragged or macerated margins. Portions of skin in which the blood supply is so poor that sloughing is virtually assured should be promptly removed. However, in many instances it is surprising to observe how a comparatively narrow pedicle will maintain the vitality of a rather large dermal flap. Since the formation of a hematoma is most undesirable, it is extremely important that a wound never be closed before the bleeding has been completely controlled by ligating every vessel which continues to ooze. In the repair of lacerations, we employ a minimal amount of chromic catgut to bring together the subcutaneous tissues and interrupted sutures of fine silk to approximate the edges of the skin (Fig. 1*b*). The use of heavy dermal sutures which include large amounts of tissue is to be condemned because they produce a great deal of unnecessary scarring. Neat, meticulous suturing and ample drainage are essential in securing a

satisfactory cosmetic result. In large undermined wounds, we prefer Penrose drains, but in those of smaller dimensions we use ordinary rubber bands; the latter make excellent drains and leave but little scarring on removal. Very superficial lacerations, after being cleansed, may be safely closed without any form of drainage. Of the utmost significance immediately after suturing a wound is the application of a pressure dressing which should be left undisturbed for at least forty-eight hours; this further obviates the possibility of the formation of a hematoma.

Regardless of the absence of gross contamination, every open wound sustained in a motor accident undoubtedly is invaded by pyogenic bacteria. However, with proper care, lacerations about the face of healthy individuals rarely show clinical signs of infection. By the phrase "proper care" we do not allude to the use of any type of antiseptic solution, but refer to such measures as débridement of the wound, complete hemostasis, adequate drainage and prevention of a hematoma. Probably no factors so favor the development of active infection in a wound as does the presence of a hematoma or the lack of sufficient drainage. Although, with appropriate management, infection of facial injuries is remote, every physician continually encounters suppurating, traumatic wounds in cases in which patients do not seek treatment early. In these cases, we adopt a most conservative regimen of therapy; we leave the wounds entirely alone except for the continuous application of hot, moist dressings until the acute inflammatory process has subsided. Recognition of the potential seriousness of a hematoma should prompt one to remove such a blood clot thoroughly from any wound whether or not the latter has been previously sutured.

Losses of tissue are frequently observed in automobile injuries about the face. In properly selected cases, such wounds afford great opportunity for the use of plastic procedures. When a small portion of skin is missing, if the margins of the defect are deeply undermined by sharp dissection, a gratifying closure can be obtained. In cases in which a large amount of skin has been lost, such treatment can only result in much distortion of the involved part; in these cases the immediate application of a skin

graft is an excellent procedure, provided that gross contamination is not evident. If the denuded region is not too large, dissected dermal grafts from the upper eyelid or the posterior

the resultant deformity; the wounds are left open for several weeks until healing is complete and until the subsequent inflammatory thickening and induration have entirely disappeared.

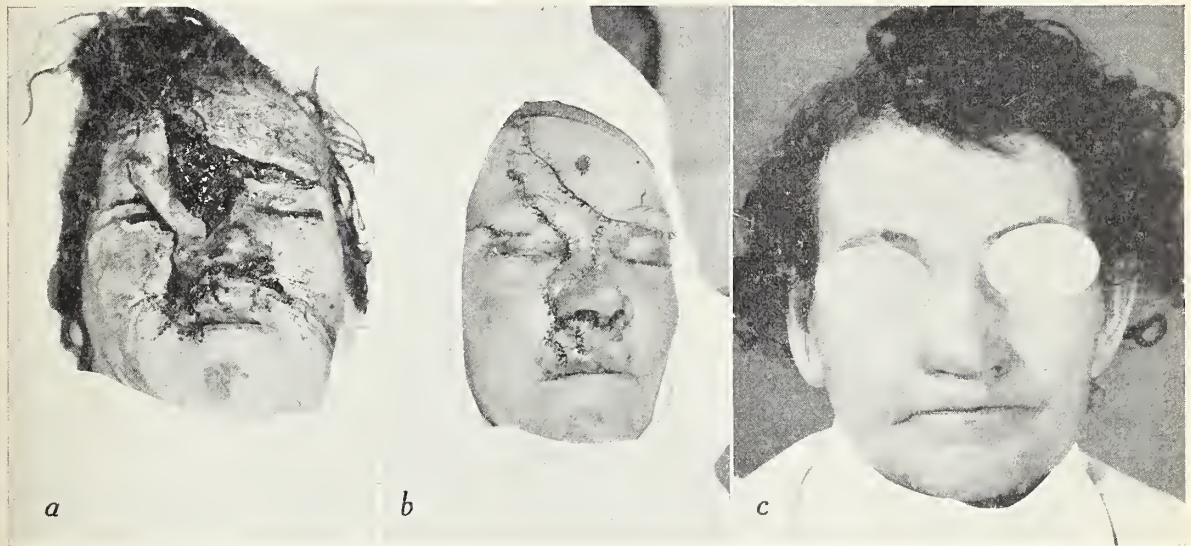


Fig. 1 *a*, Laceration of face and badly comminuted fracture of nasal bones of a guest passenger who was thrown against the windshield of an automobile; treatment was postponed for eight hours because the patient was in severe shock; *b*, photograph taken after the lacerations were cleansed and sutured; one Penrose drain and several rubber-band drains were used; the skin was closed with interrupted sutures of fine black silk; *c*, photograph taken six months after treatment of the injury; a cartilage implant will be required to correct the deformity of the nose.

auricular region are preferable because the color of the skin obtained in these situations very closely resembles that of the rest of the face. However, when a large graft is required, one is forced to resort to the employment of a dissected or shave transplant taken from the inner aspect of the arm or thigh. The act of adapting a dermal graft to a region recently denuded of skin is usually met with considerable success, and thus scarring and distortion are prevented which is inevitable when such a wound is left to become epithelized spontaneously. In badly contaminated wounds, of course, skin grafting is entirely out of the question. Instead, we apply warm dressings and defer the transplantation of skin until the infection has entirely disappeared. It cannot be doubted that were skin grafts employed more frequently the cosmetic result in many traumatic wounds of the face would be greatly enhanced.

The immediate repair of such defects as the loss of an extensive portion of the lip, cheek, nose or eyelid is impossible. Fortunately, such frightful injuries are relatively uncommon. In these cases, we elect to disregard temporarily

Then with the use of one of the delayed pedicle or tubed flaps, which was illustrated in figure 1 in an article which we wrote recently⁴ reconstruction of the missing part may be undertaken. Owing to the limited length of this paper, a discussion of this type of reparative surgery cannot be attempted.

To the surgeon and patient alike, deep facial lacerations in which the seventh cranial nerve or the parotid duct has been severed are most distressing. The former injury results in a facial palsy, the latter in an external salivary fistula. Should the main trunk of the facial nerve be divided, an endeavor should be made to suture the cut ends. If this procedure does not induce regeneration of the nerve, then the problem becomes one for the neurosurgeon. Less serious is the severance of the peripheral fibers of the seventh cranial nerve, many of which will eventually regenerate. Occasionally, as previously indicated, a penetrating laceration of the cheek will include Stenson's duct and result in an external salivary fistula. To direct the flow of saliva into the mouth rather than through the fistula, we favor the method of

Glascoek. Briefly, this procedure involves the use of strands of silkworm-gut which are inserted from the oral cavity through both distal and proximal segments of the duct and which

that is, the frontal, nasal, maxillary or malar regions. In spite of the fact that the driver is able to brace himself against the steering post and thereby ward off much of the brunt of the

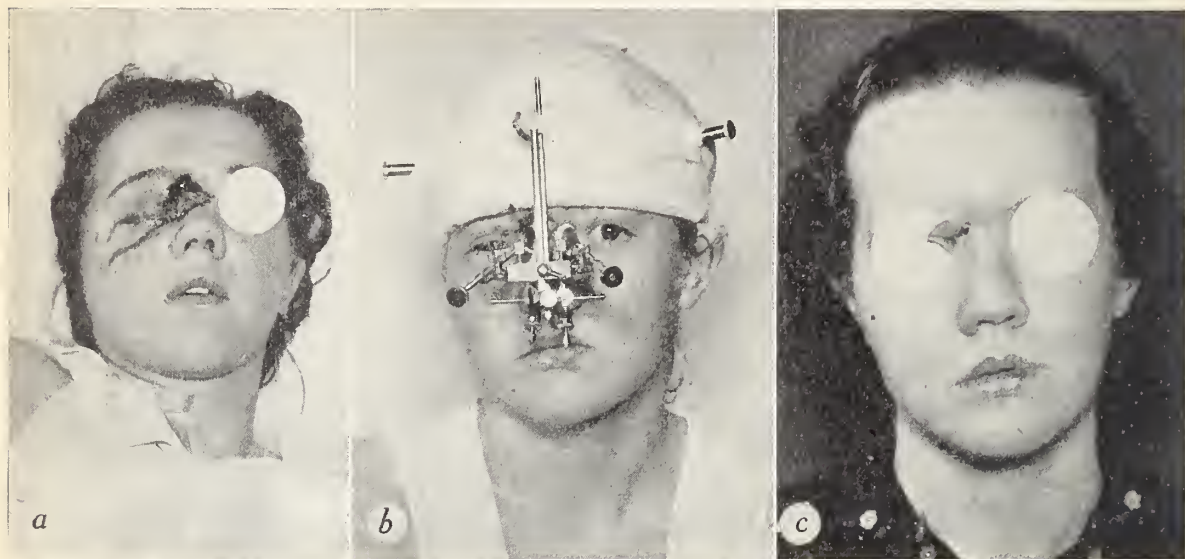


Fig. 2 *a*, Injury of the frontal region which exposed the frontal sinus and fractured the frontal nasal and maxillary bones and the malar bone; treatment was not instituted until ten days after the accident, for fear of inducing meningitis; *b*, photograph of patient taken after completion of initial treatment; right malar bone was elevated by intra-antral manipulation and immobilized by an intra-antral iodoform pack; the fragments of the comminuted nasal bones were molded into their correct position and immobilized by the apparatus shown; this has two wires which hold the nasal bones forward and has two lateral adjustable pads which produce pressure on the sides of the nose and keep the bridge narrow; *c*, photograph of patient taken six months after initial treatment.

finally emerge on the external surface of that portion of the cheek which overlies the parotid gland. A Penrose drain passed from the mouth to the lacerated region, through a stab wound adjacent to the distal part of the duct, is of great value in carrying away the excess of saliva. The external wound may then be tightly sutured. Such management encourages the flow of saliva to follow the Penrose drain into the mouth and opposes the development of an external salivary fistula. Serving as a framework along which epithelization can occur, the strands of silkworm-gut assist in restoring the normal continuity of the duct.

In automobile wrecks, it has been pointed out by Straith that passengers riding in the front seat not only are more frequently injured than is the driver but are subject to more serious injuries. Since the guest passenger lacks the support of the steering wheel, during the impact of a collision he is thrown violently downward as well as forward against the instrument panel or the windshield. His injuries are likely to involve the upper half of the face,

impact, his head may strike the steering wheel with considerable force. His resultant injuries usually involve the lower part of the face, mainly the chin and mandible.

The nasal bones are more often fractured than are other bones of the face. The treatment of simple nasal fractures is well known. Internal or external manipulation is all that is required to reduce these fractures, and, generally, no means of fixation is needed. In some cases, an intranasal pack or an external splint is necessary to maintain the nasal bones in proper alignment. Occasionally, in severe fractures of the nose, the nasal bones are badly comminuted and driven back into the ethmoid region. In such cases, owing to the probability of an associated fracture of the ethmoid bone, manipulation of the nasal bones should be postponed at least ten days for fear of inciting the development of meningitis. When the nasal bones are severely comminuted and depressed, it is useless to elevate them unless some form of fixation is available for holding the bones in the desired position. We have made an instrument which

possesses all of the necessary mechanical requirements for supporting the nasal bones in correct alignment; its principle is not original with us, but its design has been changed to suit our needs. This appliance is attached to a plaster head cast and has two wires which are inserted in the nostrils for elevating and immobilizing the nasal bones (Fig. 2b). In addition, it has two adjustable pads which maintain lateral pressure to keep the bridge of the nose narrow. In many of our cases, this instrument has proved its value in the final result (Fig. 2c).

The great majority of permanent nasal deformities following automobile accidents are due to neglect of the primary nasal fracture or are the result of poor immediate treatment. However, in an occasional fractured nose, even after the utmost care has been taken to restore the nasal bones to their original position, some deformity persists. If a patient wishes his nasal deformity corrected, it is preferable to wait at least six months after the accident before attempting a plastic repair. The most common traumatic nasal deformities are the crooked nose, which may deviate to one or the other side and which is usually associated with a deflection of the septum, the hump nose in which the nasal bones are abnormally elevated, the bulbous or broad nasal tip in which the lower lateral cartilages are markedly flared, the saddleback nose in which the nasal bones are depressed, and combinations of the foregoing deformities (Fig. 1c). The first three types of deformities are remedied by intranasal operations; displaced nasal bones are refractured and molded into their proper position; a prominent hump is removed by means of a saw or chisel and mallet, and a broad tip is corrected by readjustment of the lower lateral cartilages. Marked deflection of the septum which produces symptoms of nasal obstruction should be corrected by means of submucous resection; this operation should be performed three or four weeks in advance of the nasal plastic operation. When a saddleback deformity exists, the normal contour of the nose can be restored by means of a cartilage or bone implant. If the nose requires no treatment other than the insertion of the graft, we prefer to use bone obtained from the crest of the ilium, but if the deformed nose requires refracturing or some other form of manipulation or if there is any possibil-

ity of infection, cartilage is a more desirable tissue to transplant since its innate qualities to withstand infection or an inflammatory process are superior to those of bone.

Malar bones are often fractured in such a manner that they retain their continuity with little or no comminution. In these cases, the fractures occur along the normal suture lines, that is, through the frontozygomatic suture above, through the temporozygomatic suture laterally and through the inferior orbital foramen below. The bone is generally depressed downward and backward. Without the aid of a roentgenogram, there is often difficulty in the diagnosis of such a fracture because of the excessive swelling of the overlying soft tissues. Roentgenograms are absolutely essential, and we prefer a vertical profile view, the rays being directed from the chin toward the vertex. Such a roentgenogram shows very nicely the relative position of the two inferior orbital margins and the degree of displacement of malar bone on the involved side. When there is no comminution of a fractured malar bone, treatment is not difficult. A steel hook, inserted through a small incision in the skin, is an effective method of elevating the displaced portion of bone into position. The hook may be introduced so as to grasp the lower border of the fractured malar bone or may be inserted along the floor of the orbit to the inferior orbital fissure. Considerable force is necessary at times to bring the fragment into correct position, but, with few exceptions, no form of fixation is required. When a malar bone is badly comminuted and there is involvement of the wall of the maxillary sinus, we recommend reducing the fractures by an intra-antral operation. An opening is made through the mouth into the maxillary sinus, and by finger pressure within the antrum, the fragments are manipulated into their correct position. For immobilization, an iodoform pack is inserted within the maxillary sinus and left in place until the fragments have united, a period usually of about three weeks.

Ocular palsies resulting from injury to the floor of the orbit are unfortunate complications of fractured malar bones. Manipulation of the fragments from within the maxillary sinus will sometimes correct the ocular disturbance, but in many cases it is not possible to reduce the

fractures so that the extra-ocular muscles will function normally; in such instances, the ocular palsy remains a permanent condition. Enophthalmus, another complication of some fractured malar bones, is disagreeable and incurable. The floor of the orbit may be so badly comminuted and depressed that the eyeball will drop down a few millimeters owing to lack of support. If manipulation of the fragments does not elevate the globe, a cartilage implant along the floor of the orbit will often overcome the deformity. However, in some cases even a cartilage implant is ineffective in restoring the eye to its proper position in the orbit. A depressed fracture of the malar bone which is left untreated will produce a flattening of the involved cheek. Attempts to correct this deformity by refracturing the bone and manipulating the fragments into their proper position are usually met with little success. In these cases, we believe that symmetrical proportions of the two cheeks can be secured most easily by the use of a cartilage implant to build up the depressed region on the injured side.

The treatment of any fractured jaw is successful only when the continuity of the bone has been established and when the normal masticatory mechanism has been restored. The fragments of a fractured jaw may be firmly healed by bony union, but the end-result is a failure if the original occlusion of the teeth has not been reestablished to insure normal mastication. No single word has greater significance in any discussion on fractures of the jaws than does the term "occlusion." Nearly every fracture of a jaw in which there is the least displacement of the fragments causes some disturbance of occlusion, and unless the teeth can be brought into their normal relationship the fragments will not be restored to their original position. No factor serves as a better guide for determining the position of the fragments than does the occlusion of the teeth. Frequently, in cases of fracture of the jaws, it is almost impossible to tell by visual inspection of the mouth what relationship actually existed between the upper and lower teeth before the fracture occurred; this may be the result of loss of many teeth in each dental arch or it may be due to primary malocclusion of the teeth. In these cases, the preparation of plaster models of the dental arches will

materially aid in determining the original form of occlusion. It can be said that fractures of the jaws cannot be satisfactorily reduced unless one is certain of the original position of the teeth in each individual case.

Innumerable methods of reduction and immobilization have been described in the treatment of fractured jaws. Each has advantages and disadvantages; each is adaptable to certain types of fractures. No one method is suitable for every case. A few produce excellent results in the hands of some surgeons but not in the hands of others. Consequently, it is a mistake to attempt a comparison of the various methods. It is our opinion that those procedures with which the surgeon is acquainted and finds satisfactory are the methods he should employ.

It is a generally accepted fact that open operations for the reduction or fixation of fractures of the jaw usually are disastrous and only result in infection, necrosis of bone and ultimate loss of union. One must rely on intraoral procedures for the care of fractures of the mandible and maxilla.

The great majority of fractures of the maxilla that we see at the clinic are transverse (horizontal) in character. The entire upper jaw is freed from the rest of the skull and is usually pushed upward and backward. This injury results in an open-bite type of deformity which makes mastication impossible. The principle of treatment of a transverse fracture of the maxilla is to reduce the fracture so that the teeth of the upper dental arch will occlude normally with the teeth of the lower jaw. Regardless of how freely movable the fractured upper jaw may be, it usually is not possible to manipulate the maxilla into its correct position manually. To secure good occlusion of the dental arches in a case of transverse fracture of the upper jaw, one must rely on elastic traction as a means of reducing the fracture. We first wire arch bars to the upper and lower dental arches. This is followed by the application of a plaster cast to the head. A rubber band passed from the upper arch bar to a rod that is fixed to the head cast will pull the upper jaw forward. Vertical rubber bands stretched between the arch bars pull the teeth of the maxilla downward into occlusion with those of the mandible. When the upper jaw is freely movable, traction wires for

immobilization are attached to the upper arch bar, passed through the cheeks, and fixed to adjustable hooks on the head cast after the method described by Federspiel. In cases in which

gion on the involved side (described by Ivy, Fig. 3*b*). A wire inserted through the posterior fragment and rubber band stretched from this wire to the hook will pull the posterior frag-

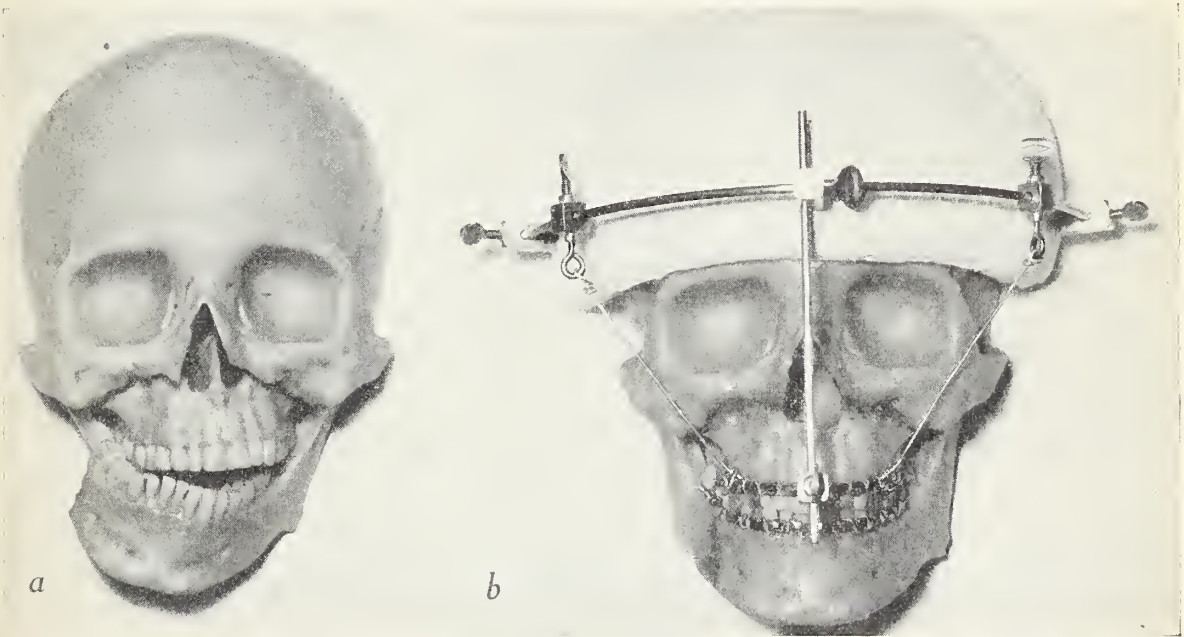


Fig. 3 *a*, Wax moulage of skull of patient injured in an automobile accident, showing fracture of right body of mandible and a transverse (horizontal) fracture of the maxilla; *b*, wax moulage of same patient; the fractures have been reduced by intermaxillary wires attached to hooked arch bars; the upper jaw has been immobilized by two traction wires attached to the upper arch bar, passed through the cheeks, and attached to adjustable hooks on a plaster head cast.

the maxilla is edentulous, the traction wires are fixed to an artificial denture worn by the patient.

The use of intermaxillary wires, arch bars and rubber bands, the ribbon arch mechanism, and the edgewise arch mechanism in the treatment of simple fractures of the mandible is well understood. We recommend that a dental root in the line of fracture should be removed unless it is the only tooth in the posterior fragment. In such a case, it is well to preserve the tooth for fixation of the fragment. When but one tooth is present in a fragment, we generally apply an orthodontia band to this tooth so that it can be used for immobilization. When the fracture of the mandible is situated behind the third molar tooth (Fig. 3*a*), the posterior fragment is often displaced forward and upward by muscular traction. To reduce this type of fracture, we first wire the teeth in occlusion in order to fix the anterior fragment; next, we apply a head cast in which is incorporated a hook that emerges in the posterior auricular re-

ment back into proper position. Many of the mandibular fractures which we see are several weeks old and in such cases elastic traction is essential in reducing the fracture. Subcondylar fractures are better left alone except for wiring the teeth in occlusion for a period of three or four weeks. If the condyle is displaced, its removal or replacement is contraindicated; we have never seen such a case in which the disturbed condyle interfered with the normal movements of the mandible. In cases of fracture of the horizontal ramus of the mandible in which the patients are children, we prefer to use a cast silver bite splint which can be cemented to the teeth of the lower dental arch; by means of circumferential wires passed around the mandible and fixed to the casting, the lower jaw is thoroughly immobilized. This gives the child free mobility of his jaws during the healing period.

An edentulous mandible which is fractured anterior to the third molar tooth on either side may be nicely immobilized by the use of circumferential wires attached to a lower artificial

denture. However, if the fracture is situated behind the second molar tooth, a Gunning double-arch splint is required; should the posterior fragment be pulled forward by muscular traction, a wire inserted through this segment of the bone and fixed to a head cast may be necessary to maintain this fragment in its normal position.

In conclusion, we would like to mention two uncommon but potentially possible complications of every fracture of the jaw. The first is non-union of the fracture; the second is an osteomyelitis with sequestration and loss of bone. When either one of these conditions involves the mandible, a repair can be accomplished only by means of a bone graft. For this purpose, we elect to use bone obtained from the crest of the ilium. Before the insertion of such a graft, it is most important to immobilize both fragments of the mandible thoroughly. After exposing the free ends of the fragments, the bone is cut to the desired shape and is inlayed and fixed between the two fragments. In these cases, one may anticipate good results if the oral mucous membrane is not accidentally incised; even a small nick insures infection of the wound by the entrance of secretions from the mouth.

An analysis of post-traumatic deformities of

the face has confirmed our belief that many such defects could be prevented if only the surgeon would devote more time and give more consideration to the primary wounds. To obtain satisfactory cosmetic results in the treatment of facial injuries sustained in motor accidents, we desire to emphasize the significance of early treatment of proper débridement of the wound, of complete hemostasis, of adequate drainage, of the use of a minimal amount of catgut, and of the insertion of fine skin suture material. Much unnecessary scarring and disfigurement of the face can be prevented by the immediate application of dermal grafts to large regions denuded of skin. Finally, in the management of fractured facial bones, we wish to stress the importance of careful preoperative planning, which aids materially in surmounting those difficulties and discouraging problems that unavoidably arise in the care of these injuries.

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EYE INJURIES DUE TO MECHANICAL CAUSES*

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THIS paper deals with injuries of the eye due to mechanical causes. It aims to present a few simple principles which may aid the physician who first sees an eye injury to determine the approximate severity of such an injury.

In any injury to the region of the eye due to mechanical causes, swelling of the soft parts around the orbit and of the lids, and wounds of these parts, will be evident at once. Marked swelling and distortion of the soft parts may hide a possible fracture of the bones of the face, of the nose, or of the orbit. When the swelling subsides it may then be discovered that there is a bony deformity, which by that time may be very difficult to correct. Since the zygoma is a

prominent structure of the face, a blunt, severe blow may fracture it without causing any other bony fractures. There have been two instances in our practice in which this has resulted from a blow of a fist. A fracture and displacement of the zygoma should be detected by bony deformity of the face, by notching of the rim of the orbit, and by a displacement of the eyeball due to encroachment upon the orbital contents by the displaced bone. The x-ray is our best single means of diagnosing this condition accurately. If nothing is done, the displaced bones may cause interference with the action of the extraocular muscles, or cause other disturbances in the functioning of the eye. A displaced zygoma can nearly always be replaced to a normal position, if the

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 1, 1939.

attempt is made within a few days, or not more than a week after the injury.

Wounds of the lids involving the margins of the lids should be repaired at the earliest possible time, for if allowed to heal without careful replacement of the parts, deformity of the lids is apt to occur. This is very difficult to correct after the parts are scarred and contracted.

The conjunctival sacs and the eyeball should be inspected if possible at the first examination. At such an examination, no elaborate instrumentarium is called for. A good flashlight, if nothing else is available, is splendid for this purpose. A solution of 4 or 5 per cent cocaine, instilled between the lids after these have been cleansed carefully, will often be of great advantage. A lid elevator is also useful, but a small smooth hook, or any small smooth instrument available, may be used to lift the lids if this procedure should be necessary to aid in the examination.

The cornea, the conjunctiva, and the conjunctival sacs should be inspected for wounds, bruises, areas of subconjunctival hemorrhage, and for foreign bodies. Injuries to the cornea are detected by a cloudiness of the cornea at the site of the injury, and by a break in the continuity of the normal reflex of the surface. Even if the lids are greatly swollen, all parts of the cornea can be brought into view through a very narrow opening between the lids by having the patient shift his point of fixation with the other eye. The presence of a foreign body can usually be suspected by the history of a scratching or of sharp pain on movement of the eyes. Pieces of glass are sometimes the most difficult of all foreign bodies to find, for their transparency increased by the moisture of the tears sometimes hides them very effectively. It is often a good plan to have the patient localize as exactly as possible the site of the pain or tenderness before any local anesthetic is instilled, for after that this means of localization may be gone.

Any manipulation about the eye, however, should be carried out with the utmost gentleness, for the damage resulting from a serious injury, such as a perforating wound of the eyeball, can be increased greatly by rough and careless handling of the eye.

There is one simple test which helps a great deal in determining the seriousness of any injury to the eye, and that is the determination of the

acuity of vision. This can be carried out quite easily if the patient is in such a condition that co-operation is possible. It need not be done with any degree of refinement but may be done roughly by the reading of the letters of any printed matter at hand, by the counting of fingers, by observing hand movements, or finally by the recognition of light. One must be sure that the vision is not obscured by external causes such as swelling of the lids, blood, or even tears between the lids. Marked photophobia is often present, and this may interfere.

If the vision is not reduced but seems to be the same as that of the other eye, there is a fair degree of assurance that the eye is not severely injured. If there is a definite reduction of vision of an eye the injury should be considered serious, at least for the time being.

Injuries to the eyeball may be either non-perforating or perforating. Non-perforating injuries may or may not be serious. If the causative blow has not been severe, the eye may rapidly become free of symptoms. A hard blow may cause severe internal injuries to the eye such as rupture of the iris, of the lens, detachment of the retina, et cetera, or rupture of a blood vessel causing intraocular hemorrhage.

A non-perforating injury may give no special findings on inspection beyond more or less congestion of the eyeball. A dilated pupil, or a displaced pupil, for which there is no other apparent cause, or a streak of blood in the anterior chamber, indicates internal ocular injury. A massive intraocular hemorrhage gives a very characteristic picture, a dark red, or sometimes altogether black, highly polished appearance of the cornea. Such a condition is always serious.

A perforating injury of the eyeball, no matter how small the perforation may be, is always a major injury on account of the possibility of infection, of injury to the delicate internal structures of the eye, and of the entrance of a foreign body. Any perforating injury carries with it the possibility of an eventual loss of vision, and even of the loss of the eyeball.

A perforation may be easily visible at first sight as a large gash in the cornea or sclera, or in both, through which iris, vitreous or other structures may be protruding. But if the perforation is small, it may be obscured by swollen conjunctiva or by blood-stained fluid and may

not be detected. A pear-shaped pupil is indicative of a perforation near the edge of the cornea with a possible incarceration of the iris in the wound.

In any perforation of the eyeball there is usually loss of aqueous through the wound with the consequent immediate reduction of the intraocular tension, and often with the complete collapse of the eyeball. Therefore, in any case in which there is a suspicion of a perforation, this may be determined by trying the tension of the eye with the tips of the two forefingers in the same manner as fluctuation in a suspected abscess is determined, using the other eye for comparison. Usually, the difference is so marked that even the inexperienced should be able to detect it readily in one trial. Again, let me emphasize the need for great gentleness in making this test in order that the damage to the eye may not be increased by the test.

There is one type of perforation in which this test is of no value. A very tiny perforation may be produced by a finely pointed instrument, or by a very tiny flying foreign body (usually a metallic one), so small that no intraocular fluid will escape. The tension of the eye then remains normal. The vision, too, may not be disturbed, depending on the part of the eye affected by the foreign body. It is a good plan to have roentgenograms taken of all eye injuries in which there is a possibility that small high velocity particles might be involved.

A few illustrative cases are appended. For the sake of brevity, only the positive findings are enumerated.

Case Reports

Case 1.—A. K., male, aged twenty.

Three weeks before this patient was seen he had had a collision with another player at a basketball game and received a blow on the left side of the face. He became unconscious and was so for upwards of fourteen hours. The face and the eye swelled up a great deal. At the time he was seen, the swelling had subsided considerably.

On examination, there was a depression of the zygomatic prominence, a notching of the lower rim of the orbit, and some degree of anesthesia of the skin of the left side of the nose. The skin surrounding the left eye was discolored. There was ptosis of the left upper lid, moderate protrusion of the eyeball and a paralysis of the external ocular muscles. The eye could be rotated only very slightly in any direction. The pupil was dilated, failed to react to light, and very slightly to accommodation. The media were clear, and

the fundus normal. Vision was 20/100; through a pin hole, 20/30.

A roentgenogram showed a fracture of the lower and lateral rims of the orbit, separation of the frontal and maxillary zygomatic sutures, and a complete transverse fracture through the small wing of the sphenoid bone just lateral to the sella turcica on the left.

In this case there was a paralysis of the third, fourth, and sixth nerves. It was believed that this was due either to an injury of the nerves by the fragments of bone in the posterior orbit, or to hemorrhage in the posterior orbit.

The loss of function in this instance was undoubtedly due to the injury; possibly to injury of the nerves from the fractured fragments. It is impossible to say if any improvement could have been obtained if the bony fragments had been restored to their normal positions, but the attempt should have been made.

Case 2.—M. L., male, aged thirty.

On January 11, 1938, while working with a road crew and using a pick on the frozen ground something flew into his right eye. His vision was immediately nil.

Examination at the office a few hours later showed a horizontal cut running through the cornea into the sclera for a distance of five or six millimeters, the edge of the cornea being about the middle of the cut. The pupil was oval with the apex pointing towards the cut, but there was no hernia of the iris in it. There was some blood in the anterior chamber. There was no vision, not even the recognition of light.

A roentgenogram showed a large foreign body inside of the eyeball.

In this case, it was very apparent from the very outset that there was an injury so severe, and the prognosis so hopeless, that there was no hesitation in recommending the immediate removal of the eyeball as the quickest and most effective way of recovery. Consent to this was refused.

The foreign body, which proved to be steel and magnetic, was removed from the eye. Tetanus serum was administered, and other measures taken to counteract inflammation and infection.

There was no return of the vision, and the eye was finally enucleated to avoid the possibility of sympathetic inflammation in the other eye.

Case 3.—P. K., male, aged forty.

In 1920, while hammering on a brake connection, something hit him in the left eye. Examination then had showed a small perforation of the lower lid, but no suspicion of anything further. The vision seems to have been clouded for a while and then became almost normal. In 1922, two years after injury, the vision began to fail quite rapidly. He visited an ophthalmologist, who found the iris rust-colored, a condition known as siderosis, and made the diagnosis of tiny piece of steel in the eye.

The fragment was removed (by the magnet?) but no promise was made of return of the vision. The

eye remained quiet, but with a vision limited to recognition of light until in January, 1938, when a glaucoma with a very high tension and with marked pain developed. On account of this the eye finally had to be enucleated.

I believe that, if this eye had been watched more carefully, and the vision taken several times following the first injury, it would have been found to have been reduced, and thereby given rise to a suspicion of something wrong in the eye in time to remove the fragment of steel before the eye had been ruined.

Case 4.—J. B., male, aged twenty.

On May 17, 1937, a companion shot a broken wire paper clip by means of a rubber band at the patient. One prong of the clip penetrated the upper lid of the left eye, stuck there and was pulled out by the patient. The vision, as the patient remembered it, was not disturbed. He visited an ophthalmologist after a few hours, who evidently did not think anything serious had happened for he instructed the young man to wear a bandage for about a week and then to return.

Everything went well until the third day, when the eye became inflamed and the vision somewhat reduced. The next morning the eye was very painful and the vision very poor. He came to our office on the fourth day. The eyelids of the injured eye (the left) were very swollen, the upper lid showed a very tiny red spot in the upper temporal aspect of the lid, which the patient stated was the point of penetration by the clip. The conjunctiva was red and congested, the cornea steamy. No wound of the cornea or conjunctiva could be seen. The pupil was contracted, the iris swollen and discolored, the media cloudy, and the eyeball tender. The vision was limited to recognition of light.

This was a severe, acute panophthalmitis, the evident assumption being that the infection had been introduced into the eye by the paper clip perforating not only the lid but also the sclera.

A hole in the conjunctiva as small as this is usually not visible. It may too be possible from the position of the puncture of the lid that the clip penetrated the sclera entirely posterior to the conjunctival fold, thus producing no mark whatsoever on the conjunctiva. As the puncture was likely about at the equator of the eyeball, it would not have been visible with the ophthalmoscope through the pupil. With a normal vision, a normal tension of the eyeball, the physician cannot be blamed for assuming that the injury was a harmless one. In retrospect the only circumstance that might have given rise to apprehension on the part of the physician would have been the fact that perforations of the eyeball occur very easily from small sharp missiles coming at great velocity.

In spite of all treatment, matters went from bad to worse, all recognition of light disappeared, the pain persisted, and the eye finally had to be enucleated to stop the pain and end the disability.

Case 5.—E. G., male.

On November 3, 1937, this patient came to the of-

fice stating that four days before, while hammering on a cold chisel in repairing a big chain, something flew from the chisel and hit him in the right eye. He believed that the eyelids were open at the time and that he was looking directly at the chisel. The object which hit him was apparently a large one for it gave him a blow so severe that he staggered and the pain almost made him faint. However, he recovered quite promptly and kept working that day and also the next day. Towards evening of the second day the eye began to be painful, and the vision became cloudy.

Examination of the right eye showed the conjunctiva of the eyeball to be reddened, mostly on the temporal side. The cornea was clear. The iris was somewhat swollen and its normal markings indefinite. There was a small amount of exudate in the anterior chamber. The eyeball was tender but tension was normal. The media were cloudy. The vision was reduced to recognition of light.

A roentgenogram was obtained and that showed a very tiny spot which might be from a foreign body in the eye, but after taking several films its presence was still a matter of doubt.

Here it is very evident that a more or less serious injury to the eye had taken place from the fact that the vision was very much reduced, and there was clouding of the media of the eye. This could happen from a blow from a large blunt object, but the presence of a tiny foreign body in the eye could not be ruled out. If there was a foreign body in the eye, it would in all chances be steel and magnetic. Two courses of procedure were here open: First, to make an opening in the eyeball, insert the tip of the magnet and search for the foreign body. In that case, if there were then no foreign body found, the manipulation would give added risk to the eye. If, on the other hand, a foreign body were present, and no attempt were made to remove it, the eye would become ruined. Second, to institute temporary conservative treatment and watch the eye very carefully for developments. The latter course was followed.

No serious infection in the eye occurred, and after two months the cloudiness of the eye had largely disappeared and some degree of vision had returned. It was then possible to examine the fundus with the ophthalmoscope. A very tiny black speck was found on the retina about ten millimeters below the disc. An incision was now made in the eyeball, the tip of magnet inserted, and the foreign body removed. The eye went on to eventual recovery and restoration of perfectly normal vision.

Case 6.—L. C., male, aged twenty-three.

On December 16, 1935, this patient was seen on account of an injury to his right eye which had been sustained two days before by a blow on the eye. He had not thought that the injury was very severe. His vision had remained good until the afternoon of that day, when it had suddenly failed.

On examination, the eye appeared reddened. The cornea of the eye showed a brownish black shiny.

color. There was no iris nor any other details of the interior of the eye visible. The eyeball was hard.

This eye presented a very evident intraocular hemorrhage—how extensive, it was impossible to tell. If it were limited to the anterior chamber only, then there might be some hope of saving the eye with some restoration of vision. If the blood filled the whole eye, the prognosis would be hopeless.

The eye was watched for a few days, then an incision was made into the anterior chamber, and an attempt made to wash out the blood. Some clots were removed but others still protruded through the pupil from the posterior part of the eye. Following the operation, treatment did not produce much result. The tension of the eyeball remained high. The eye remained blind, painful, and irritable, and enucleation was finally advised.

Case 7.—J. H., male, aged twenty-eight.

In September, 1938, this man was on a vacation trip in the lake region north of Duluth with a party of friends from out of the State. While out fishing, the hooks of a casting plug caught in the patient's right eyelids and right eye. Since it was impossible for the man's companions to remove the hooks, they cut the hooks off close to the eye with pliers, and then brought the patient to Duluth as promptly as possible.

On examination, it was found that there was a wound in the right eyebrow in which the end of a steel fishing hook could be seen. Another end of a hook was located in the right upper lid about 5 mm. above the lid margin. There was a cut five millimeters deep on the margin of the upper lid about the junction of the lateral and middle thirds. The eyeball showed a penetrating wound of the cornea three or four millimeters long in the upper temporal quadrant. Protruding in this was a tag of the iris and a little vitreous.

In spite of the distortion of the structures of the eye, there was a good recognition of light from all directions.

This case is reported to show that even in a very evident severe penetrating injury of the eyeball the outlook is not necessarily hopeless. The facts that some vision was present, and that the inside structures of the eye did not seem too much lacerated, gave some hope.

The patient was taken to the operating room. Very careful cleansing treatment was given, the hooks were removed from the lids, and the lid margin repaired. The protruding iris in the wound in the eyeball was excised, and both eyes bandaged. Tetanus antitoxin was administered, and a course of other foreign protein treatment given.

The eye showed no signs of infection at any time, which was remarkable, and the wound went on to rapid healing.

The patient was discharged from the hospital after twelve days, was allowed to return to his home, and was referred to a local ophthalmologist for further

treatment. A report at the end of December, 1938, over three months later, stated that the vision had become better all the time, and in November he had taken an examination for Civil Service and was accepted. He had found that he could use the eye for rifle shooting but not quite so successfully for pistol shooting.

Case 8.—E. C., male, aged twenty-eight.

On August 17, 1938, while riding in the front seat next to the driver, a collision with another car occurred and the patient was thrown against the windshield and sustained rather extensive cuts about the left side of the face, the nose, and the left eye. He was seen soon after by his physician, who repaired the cuts. On account of the marked swelling, no view of the eyeball was obtained. During the next three days the patient made no complaints excepting that at times he would have a sharp pain in the left eye. On the fourth day, the swelling had subsided somewhat, and the eyeball was inspected and a wound of the cornea was discovered. He was then referred for consultation. On examination, a perforating wound was found in the cornea near the center in which the iris had become incarcerated. There were no signs of infection. He recognized light from all directions. We were about to terminate the examination when, upon taking a final look into the conjunctival sacs, we found, much to our astonishment, a thin, flat piece of glass which happened to be curved so that it lay quite snugly against the side of the eyeball and was not readily noticeable. A roentgenogram revealed no sign of any intraocular foreign body, nor any fracture of bones. Since it was impossible to replace the protruding iris, it was cut off and the portion adherent to the wound was cauterized. The patient made a good recovery with a final vision of 20/30.

Here is illustrated the necessity of the earliest possible examination of the eyeball, and, too, even though one lesion may be found, a thorough examination for other lesions should not be neglected.

Summary

1. If the injury in the region of the eye is gross, always consider a fracture of the zygoma as a possibility. A roentgenogram will usually determine this.

2. Always inspect the eye for evident injuries to the eyeball, or for foreign bodies within the lids.

3. If there is a definite reduction of vision of the injured eye, consider the injury a serious one until the contrary can be ascertained.

4. If the tension of the eyeball is definitely reduced there is in all likelihood a perforating wound of the eye. A perforating wound of the eye is always a grave injury.

DYSPHAGIA*

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DYSPHAGIA is a symptom which frequently brings the patient to the doctor. It is seen at all ages and must always be carefully considered even when the examiner feels that the patient has no organic lesion. It is better to regard a case as organic and find eventually that it is functional than to make the diagnosis of a functional disorder and then find, at a later less hopeful stage, that there is something organically wrong.

A brief explanation of the normal process of deglutition should precede a discussion of the causes of dysphagia. After the food has been placed in the mouth, chewed, and covered with saliva, the bolus of food is passed backwards to the pharynx by closure of the lips and pressure of the tongue against the palate. From the back of the tongue to the clavicular level the bolus of food is largely carried by negative pressure created when the hypopharynx is opened with the mouth, nasopharynx and larynx closed.¹ The food is thus tipped over the back of the tongue and sucked into the open mouth of the laryngeal pharynx and some distance down the esophagus. This initial impetus may carry liquids to the cardiac opening but solids usually are propelled by peristalsis. When liquids are swallowed with the head at a lower level than the rest of the body, each mouthful is propelled along the esophagus by peristalsis as in the case of deglutition of solids. The cardia of the stomach then relaxes and the bolus passes into the stomach.

These facts are mentioned because any defect in the act of swallowing from the opening of the mouth to receive the food to the final relaxation of the cardiac orifice leads to dysphagia of greater or lesser degree.

The cases of dysphagia may be placed in three groups:⁸

- A. Those due to pain.
- B. Those with mechanical difficulty.
- C. Those having nervous disability.

Dysphagia Due to Pain.—Infection or carcinomatous ulcerations of the mouth, tongue, tonsils, pharynx and larynx may make swallowing of even liquids difficult. Retropharyngeal abscess may be a common cause of dysphagia in children. One of the worst symptoms of advanced tuberculous ulceration of the larynx is the great pain on swallowing.

In the esophagus, foreign bodies, peptic ulcer or esophagitis may cause dysphagia due to pain.

Mechanical Causes of Dysphagia.—Inability to open the mouth because of trismus due to tetanus, affections of the temporo-mandibular joint or the muscles of mastication, and stenosis of the mouth due to caustics may make the ingestion of food difficult. Scarring, fixation or partial loss of the tongue result in considerable difficulty in swallowing. Lack of saliva may also be a cause of dysphagia.

Lesions of the palate such as congenital or acquired defects and new growths interfere with normal swallowing. Carcinoma of the pharynx may cause dysphagia early in its course.

In the esophagus, foreign bodies, congenital, benign and malignant strictures and perforation of the esophagus may block the esophagus. Compression stenosis of the esophagus by substernal thyroid, aortic aneurysms and mediastinal masses and hiatus hernias are similarly mechanical causes of dysphagia.

Nervous Causes of Dysphagia.—Facial paralysis (N. VII), pharyngeal paralysis (N. IX, X, XI), and paralysis of the tongue (N. XII) interfere with the well coördinated mechanism of deglutition. In myasthenia gravis, dysphagia is present as an early symptom.

The Plummer-Vinson syndrome called by some hysterical dysphagia¹¹ has often been included under the nervous causes of dysphagia. Kelly⁵ believes that spasm at the entrance of the esophagus is the primary condition. More correctly this dysphagia is part of a syndrome of hypochromic anemia occurring in middle aged women

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and probably due to chronic blood loss. These patients have glossitis, with atrophy of the mucosa of the mouth, tongue, esophagus and sometimes stomach, and often achlorhydria. In only 10 to 15 per cent of these cases does dysphagia occur.

There is another group of neurotic patients in which the dysphagia is purely functional. However, it should be remembered that there is no reason why a neurotic individual may not have an organic lesion in the esophagus.

The lesions of the esophagus will now be considered in more detail.

Pharyngeal Pouch.—By confusion of terms, this condition has often been considered as an esophageal lesion. However, this pouch originates in middle aged persons, at the site of a small gap in the fibers of the inferior constrictor of the pharynx. These patients early note an irritation and an increase of mucus in the throat. As the diverticulum increases in size a characteristic gurgling noise is noted on swallowing. Regurgitation of unaltered food, usually that taken at the beginning of the meal, occurs. In the late stages, the weight of the contents of the sac pulls on the esophagus until it becomes a narrow slit causing increasing dysphagia. The treatment of choice is a two-stage surgical excision of the pouch.

Other Diverticula of the Esophagus.—Traction diverticula occur in the thoracic esophagus as the result of adhesions of inflammatory bronchial nodes dragging on the wall of an esophagus already fixed, producing a tent-like projection of the wall. These diverticula are usually without symptoms and require no treatment.

Congenital diverticula of the esophagus which occur most commonly just above the diaphragm are likewise without symptoms.

Foreign Bodies.—A careful history to determine the character of the foreign body and any previous dysphagia is very important. The dysphagia may be complete or incomplete. Substernal pain with radiation to the back may be present. In many cases in which a foreign body has been swallowed, as for instance a fish bone or a small meat bone, the patient often complains of pain when swallowing for some days

afterwards, but actually has little difficulty in swallowing his food. The mucous membrane has probably been scratched at the time the foreign body was swallowed but this heals quickly. Complicating symptoms of perforation may occur after a foreign body has become lodged in the esophagus.

Congenital Atresia.—In about 80 per cent of the cases of congenital atresia of the esophagus there are associated tracheo-esophageal fistulae.⁹ In this most common type of atresia of the esophagus the upper segment terminates blindly just above the bifurcation of the trachea, while the lower segment has a fistulous communication with the trachea about 0.5 to 1.0 cm. above its bifurcation.

The symptomatology associated with this anomaly is so characteristic that it should be readily recognized. At birth the child appears to be well nourished and usually well developed but has difficulty with large amounts of frothy mucus filling the mouth and pharynx, and drooling from the side of the mouth. When fed, the child eagerly takes the breast and after a few swallows stops, ceases to breathe, becomes cyanotic, and regurgitates frothy mucus and feedings through the nose and mouth. The child appears as if it would drown, but after a period of lifeless relaxation usually recovers and repeats this episode with each subsequent feeding. These infants rapidly lose weight due to starvation and dehydration and often develop an aspiration pneumonia.

The diagnosis is confirmed by passage of a catheter or bougie which meets obstruction 10 to 12 cm. from the alveolar margins, and by x-ray visualization of the blind pouch with lipiodol filling. The presence of air in the stomach in association with atresia of the esophagus is evidence of a fistulous communication with the lung.

The prognosis in these cases has usually been considered hopeless but survival of some of these patients for more than three months following surgery has lent encouragement to this type of treatment.⁶

Acquired and Benign Stricture.—In these cases a history of swallowed caustic or acid, of antecedent trauma to or infection of the esoph-

agus can be elicited. In the case of swallowed caustic there is early pain, salivation, and often complete dysphagia. Then the dysphagia subsides as the edema lessens and swallowing may seem quite normal. In about six weeks the dysphagia increases when cicatricial contraction takes place.

The treatment is gradual dilatation by graduated sounds passed over a swallowed twisted silk thread. Treatment should be persisted in until a size No. 45 French sound is passed, when the caliber of the stricture is large enough to pass solid foods.

Carcinoma of the Esophagus.—About 40 to 50 per cent of all lesions of the esophagus are due to carcinoma^{4,12} and 4 to 5 per cent of all cancer deaths are the result of carcinoma of the esophagus.¹⁰ Ninety per cent are squamous cell carcinomas and are highly malignant.¹³ Men are five times as frequently affected as women.¹² The average duration of the disease is seven to nine months with a history of gradually increasing dysphagia—first to solids, then soft food and later to liquids. Pain may occur early in lesions high in the esophagus but is late in the low lesions and when it occurs there, usually indicates extension beyond the esophagus. The common complications are: involvement of the recurrent laryngeal nerve, causing hoarseness due to vocal cord paralysis; perforation into the trachea or bronchi forming an esophago-tracheal fistula and leading to aspiration pneumonia; and hemorrhage which may be fatal.

In treatment, the best means of palliation is dilatation by means of graduated sounds passed over a swallowed thread as a guide. Gastrotomy, unless done early, carries a high mortality.⁷ Definite relief is obtained in some cases by irradiation but in others the reaction incident to irradiation only seems to add to the discomfort.

In recent years, more frequent successes by surgical extirpation of cancer of the esophagus should make us aware of the value of early diagnosis.³ Esophagoscopy examination has chiefly been used to verify an established diagnosis. For early diagnosis all patients with subjective abnormality in swallowing should be promptly examined with the esophagoscope. Steadily increasing dysphagia in a man past fifty is indicative of cancer of the esophagus.

Cardiospasm.—In cardiospasm there is a diffuse dilatation of the esophagus without anatomic stenosis, a spasm being present at the cardiac end of the esophagus. Dysphagia in these cases is noted with liquids as well as solids, and is especially severe in the case of cold liquids. The obstruction may be intermittent at first, but becomes progressively worse. The patient can often wash food down with water but cannot swallow water alone. Epigastric pain, present in the majority of these cases, often disappears with the onset of dysphagia. This pain may radiate to the back and retrosternally.

Regurgitation at first is immediate on swallowing and later when the esophagus has dilated may be delayed hours or even days. Nocturnal regurgitation is common. This is often accompanied by aspiration of food causing choking and later chronic pulmonary suppuration.

Medical treatment using amyl nitrate or nitroglycerine is sometimes effective in relaxing the cardia. Dilatation of the area of spasm by the Plummer hydrostatic bag is the most effective method of treatment. In cases which fail to respond to all other therapy, cervical sympathectomy has proved of value.²

Perforation of the Esophagus.—A history of previous instrumentation, swallowing of a foreign body, a previous esophageal lesion or an attack of violent vomiting, preceding the perforation, is usually obtained. The patient complains of severe retrosternal or epigastric pain, dyspnea and dysphagia. He appears prostrated, has an elevated temperature, tachycardia and shallow rapid respirations. Emphysema in the neck or over the chest may be noted.

A few of these patients recover without surgical intervention, but the vast majority will die if nothing is done.

Comment.—In most of the cases of dysphagia the diagnosis may be readily made. Careful inspection should reveal any abnormalities in the mouth or pharynx. The hypopharynx and larynx are easily accessible to examination with a laryngeal mirror. In the diagnosis of lesions of the esophagus a careful history will usually indicate a correct diagnosis. The most valuable and

safest method of examination of the esophagus is by the x-ray.

Blind passage of bougies or sounds is to be condemned because of the danger of perforation of the esophagus. However, passage of graduated sounds over a swallowed twisted silk thread as a guide according to the method of Plummer is a safe procedure and most valuable as a diagnostic aid and a method of treatment.

The esophagoscope is an important adjunct in confirming the roentgen diagnosis and in many instances may give more accurate information concerning certain intra-esophageal lesions. For the early diagnosis of carcinoma of the esophagus, any patient with subjective difficulty in swallowing, especially a man over fifty years of age, should be examined by the esophagoscope.

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THE TREATMENT OF ATOPIC DERMATITIS*

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THE treatment of atopic dermatitis is a subject of general medical interest, most particularly to dermatologists, allergists and pediatricians. It involves two considerations: first, treatment directed at the cause, if demonstrable; and, second, symptomatic relief. The former, as far as allergy is concerned, leaves much to be desired. The latter is often inadequate. However, better therapeutic results can be obtained in a greater percentage of patients if both factors are considered in treatment, rather than relying on either one alone.

Allergic Considerations

The enthusiasm for food as the cause of atopic dermatitis is decreasing. It does occur, but the results from diet restriction alone are generally unsatisfactory. The errors, in the past, were due in part to improper evaluation of skin tests and to general enthusiasm because of an occasional startling result. Skin tests, either scratch or intradermal, have, however, a place in the diagnosis of atopic dermatitis if their

limitations are appreciated. They are about 25 per cent accurate in this condition, in all age groups, being more accurate in children and decreasing with age, even though the number of positive skin reactions increases as the individual becomes older. Skin tests with food extracts are difficult to interpret, as well as unreliable. Their value depends upon the experience of the physician.

The direct testing of infants, even when done with utmost care, is difficult to interpret because most irritations produce varying degrees of erythema and urticaria. This same factor is encountered in patients with urticaria and dermographism. Reactions in this group have more clinical significance when obtained by the passive transfer method of Prausnitz and Kustner. Therefore, positive cutaneous tests should serve only as a starting point of elimination management. The benefit derived from omission of an ingested substance can be evaluated in five to seven days. If there is improvement, they should be added to the diet individually to ascertain specific clinical importance. To accomplish this accurately, the physician must have a knowledge of what composite foods contain, so

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that the patient can be correctly informed. By so doing, a comparatively short period of time is necessary to establish the status of a number of suspected substances. There should be no prolonged restricted diets of months' duration, without both patient and physician knowing that ingestion of a substance, either qualitatively or quantitatively, causes an aggravation of symptoms. This can be accomplished by instructing the patient to eat specified amounts and as to the interval at which a food may be taken. Often, when several substances have been omitted for a period of weeks or months, repeated ingestions may be necessary to resensitize the patient, as there is a definite relationship between clinical sensitivity and the frequency with which a food appears in the diet. Some patients have an aggravation of eruption by most ingested materials; to avoid all of these for a considerable period of time is more dangerous than their disease. In such cases, some type of non-specific therapy should be tried.

Elimination diets may be used, but they are of value only in detecting ingestant factors. They are in principle a restricted, specified menu of uncommonly used foods. This method of study used by Rowe⁵ and Alvarez¹ is practical in a limited group of patients. They should be observed frequently and regularly, in order that accurate deductions can be made from omission and addition of specified substances. The greatest difficulty encountered is in interpreting cumulative effect, because of limitation of foods permitted.

Substances referred to as inhalants are sometimes called contact reactors, but are in reality multiple positive scratch tests. The substance, air-borne or by contact, is deposited on an excoriated or irritated skin, which causes an exacerbation of symptoms and signs, the degree of which varies directly with the amount and type of reagent and the sensitivity of the individual. The increase of eruption and pruritus in addition to scratching sets up a vicious cycle. This contention is supported by the fact that very few of these substances cause eruptions when applied as patch tests to the unbroken skin. This conception is in accord with the views of Hill,³ who found that when using the environmental allergens which were positive by scratch tests the patient had positive patch tests when

the skin was abraded, but negative when applied to the intact skin. Many of these are common environmental substances, such as house dust, orris root, feathers, silk, sheep wool, goat hair, et cetera. It is also probable that these are oftentimes secondary or irritating factors and if the underlying cause can be successfully avoided they are no longer effective. This may explain in part the improvement which follows hospitalization of patients with atopic dermatitis. Bland ointments, especially pastes and Unna's occlusive dressings, when applied to an eczematized skin, serve as a protective covering against irritating substances.

Inhaled materials can also cause atopic dermatitis and neurodermatitis. Sulzberger and Vaughan,⁶ in experiments on patients with silk hypersensitivity, state: "The most plausible explanation of this phenomenon seems to be that the silk allergin is absorbed in the blood stream (by way of the respiratory tract) of the patient and disseminated to the vascular hypersensitive areas of the skin." Zakon⁷ and Taub have reported atopic dermatitis due to the inhalation of house dust and horse dander. The respiratory tract as a portal of entry is not rare and should be considered in all patients with large skin reactions, especially seasonal and occupational eruptions or those associated with rhinitis, bronchitis or bronchial asthma. When food extracts give large scratch, intradermal or passive transfer reactions, comparable to pollen antigens, they should be considered not only as ingestant factors but also as inhalant causes. Although this is demonstrated most frequently in adults, it should not be neglected as a consideration in the treatment of infants and children.

Treatment by avoidance in this group of patients is not always possible nor practical. The intimate association with dust, feathers and animal epithelials is such that desensitization by subcutaneous injection should be attempted. It should be given a trial in occupational disease, because of the economic factors involved. The results of these treatments, if used in adequate dosage and over a sufficient period of time, are effective in some patients in the alleviation of a portion of their symptoms. Whether the effect of this treatment is specific, has not been satisfactorily explained, as all cases showing clinical improvement do not show a comparable diminu-

tion in the skin test reaction. Generally, however, patients receiving the most benefit show a decrease in intensity of the cutaneous test. Systemic reactions can and do occur following this type of treatment and are most commonly manifested by increase in pruritus, dermatitis, urticaria, rhinitis and bronchial asthma. Therefore, injections should follow dilutions, schedules and precautions as used in pollen desensitization.

Symptomatic Therapy

Palliative treatment is essential in the majority of patients with atopic dermatitis and should be used in conjunction with specific therapy whenever possible. Oftentimes it is the only method which can be used to any advantage. The multiplicity of medications and treatments used by competent observers indicates that none is adequate in all instances. There are, however, certain important factors that appear to benefit the majority of these patients. Among the most important are: changes in environment, non-specific therapy, physiotherapy, and local medication. Change in environment is most easily accomplished by hospitalization where contact factors can be reduced in number, and diet and medication can also be supervised. Most patients have temporary improvement from this procedure. Occasionally change of occupation is necessary. Others gain relief after moving to a warmer climate. Neurocirculatory instability is present in a high percentage of atopic patients, and such cases are helped by physical and mental rest and correction of the underlying instability and exhaustion.²

Various types of non-specific therapy have been used in treatment. Perhaps the simplest is autohemotherapy. This results in some improvement in a few instances. Intravenous typhoid, sodium, thiosulphate, Ekzebral, hyperpyrexia, intramuscular milk, and splenic extract have been tried with varying results. Histamine⁴ has also been used recently. Most of these, if effective, tend to lose their efficacy if given over a period of time and eventually are useless or appear to aggravate the symptoms.

Ultraviolet light, in tonic doses, appears to benefit some patients if used for a considerable period of time. Oftentimes symptoms and eruption are increased, especially if the dosage be

sufficient to produce erythema. Superficial x-ray therapy may be used in older patients if other palliative measures fail, and then only with caution and realization that atopic dermatitis is a chronic recurring disease and that repeated exposures may result in radio-dermatitis, a condition more serious than the atopic dermatitis.

The choice of local medication is based upon the presenting primary and secondary lesions. For purposes of treatment, they can be divided into acute, subacute and chronic. Acute eruptions, manifest by bright erythema, papulovesicles, edema, often respond satisfactorily to astringent wet compresses of lead acetate and alum solution, boric acid or normal saline. This is suitable if lesions are located on the extremities or face. The presence of secondary infections, pustules, and impetiginized areas may be treated with dilute copper and zinc solutions or potassium permanganate. When crusting is localized or extensive, Ung. acid boric or Ung. diachylon can be used for a short period until crusts are removed, following which the treatment is as previously mentioned.

Soothing alkaline antipruritic lotions may be of benefit in extensive eruptions where exudation is not marked, or where packs are unsuitable. Restraints aid in keeping medication in place as well as preventing scratching and excoriation.

Treatment should be continued until there is maceration of vesicles, decrease of edema and erythema. When this occurs, symptoms will decrease and the eruption may be treated as subacute or chronic.

Subacute or chronic stages, present as papules, papulovesicles, dull erythema and lichenification; secondary lesions consist of excoriations, scales and crusts. In these stages the most valuable medication is ointments containing tar, particularly crude coal tar ointments, the percentage varying from one-half to six per cent. Pastes are preferable to greasy ointments. Irritation is not uncommon; however, this can be avoided if a small trial area is used and if weaker dilutions are prescribed. A common occurrence is to have a rapid favorable response, followed by sudden irritation; therefore, the patients should be instructed to discontinue the paste if this occurs. Tar used in hair-bearing areas over long periods is prone to produce folliculitis and

pyodermas. This disappears rapidly on discontinuance of the medication. Multiple keratoses may also appear after prolonged use of tar ointments; they also disappear on cessation of this treatment. Crude coal tar, although very effective, has many disagreeable features, and substitutes may be tried. Bland ointments, such as zinc paste, with 0.5 to 1 per cent phenol or 2 to 10 per cent ichthyol may be used; drying lotions, such as calamine or zinc lotion, with 5 to 10 per cent liquor carbonis detergens, may give desired results.

Greasy ointments with or without medication, and soapy water, tend to aggravate eruptions. A few medications intelligently used, and a knowledge of their indications, contraindications and methods of application, is of utmost importance.

Summary

The best results in the treatment of atopic dermatitis can be obtained by therapy directed

at specific cause and by palliative measures. Skin tests are of value in detecting some causative factors. Local therapy is indicated in most patients and if this is based on presenting clinical signs is a valuable aid in obtaining symptomatic relief.

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THE SYMPTOM OF HEADACHE AND SOME CONDITIONS SUGGESTED BY IT*

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HEADACHE is a complaint so common that remedies for it are disbursed through slot machines and so vaguely understood that most headaches have been attributed by different writers to disorders of the gastro-intestinal tract, to allergic reactions, to disease of the nose, and most of them, indeed, almost without exception, to the eyes. It is, therefore, deserving of at least passing notice. A further excuse, if one were needed, for dwelling on the subject of headache, is that a few fragments have been added to our knowledge of it.

Often not, headache is a symptom that occurs without signs. It is this situation I should like to discuss. Here all we have to lean upon is the answers to a few questions. These are fragile reeds at best, especially so, if we fail to understand, not what the patient says, but what he thinks he says. Let us ask

him, for example, what he means by headache. It need cause us no surprise when he says that it means a sensation of ants crawling over the scalp. To the question, "Did you never have a headache previous to three months ago?" he may reply, "Oh, yes, I've had headaches all of my life, but they did not trouble me until three months ago." Having just said that they occur only on the right side of the head, he may admit that they sometimes do occur on the left.

Likewise, we should inquire into the frequency, duration and exact location of the headaches; the hour of night or day and the day of the week they may occur; whether they are becoming better or worse; whether there is an aura; what influence a delayed meal, late sleep, worry, fatigue, and use of the eyes have on the headache; whether stooping, jarring or shaking of the head influences the pain; whether cold drafts or local heat affects them; whether there is a family history of headache, hay fever,

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asthma, eczema, urticaria or angioneurotic edema, and whether particular foods precipitate a headache; whether there is evidence of infection or obstruction in the nose or ears; whether the menses or pregnancy influences the headache, and finally what previous treatment was given. Nor must we forget that a patient may have two kinds of headache, the one, perhaps, of little consequence; the other, perhaps, the symptom of a fatal illness.

Let us return to the patient and see what his story suggests.

The Headache of Increased Intracranial Pressure

Perhaps the headache is relatively recent in onset, and is causing more and more discomfort; it is located in the front or in the back of the head, or, if predominantly one-sided, recurs in the same location. Possibly also the headache awakens the patient early in the morning, and may be accentuated or precipitated by coughing, stooping, straining, or shaking the head. There may be associated with it also sudden vomiting, especially before breakfast, and the pulse, if felt carefully for two or three minutes, may be observed to become slow and irregular at times. Such a headache suggests organic intracranial disease, increased intracranial pressure, and this in turn suggests the possibility of tumor of the brain. To be sure, there may be no headache whatever with tumor, even when the intracranial pressure is elevated, and there may be headache with tumor, even when the intracranial pressure is low.¹⁵ Tapping of the ventricles may either relieve the pain or cause it.² The injection of histamine may reproduce the headache, which suggests that, even with tumor, the pain may arise from the arteries.¹⁵

An intense, recurring occipital or frontal headache, of sudden onset and termination, lasting a few minutes to a few hours, which is associated at that time with nystagmus, vertigo, rigidity of the neck, often in extension, less often in flexion, which may be associated with hiccup and slowness and irregularity of the pulse, a headache in which these symptoms are present at the time of the seizure but not during the intervals, suggests an intermittent hydrocephalus, and this in turn a tumor in the ventricular system. Choking of the disks is often absent. Dur-

ing such an attack the patient may look as though he were about to die, and he often does; during the interval he may appear to be in the best of health.

The ingestion of large amounts of fluid or the giving of a standard enema may lead to disastrous results. Spinal puncture, especially in cases of supratentorial tumor, and, according to the usual advice, in cases of infratentorial tumor, is unsafe. The intravenous administration of hypertonic solutions may relieve such a headache but this may be followed later by a severe reaction. The restricted intake of sweetened fruit juices and the instillation of a hypertonic enema may be helpful.

The headaches of sinus thrombosis, meningitis and encephalitis lack well defined characteristics, save that they are often severe and stubborn. More often than not they are attended by signs of disease that at least cause us to flounder among opinions regarding the many possibilities.

Headaches Associated with Decreased Intracranial Pressure

Occasionally an occipital or frontal headache comes on only when the patient is up and about and leaves when the patient lies down. Such a headache is often associated with a low pressure of the spinal fluid. Thus it resembles post-puncture headache. Often it suggests an arteriosclerotic basis, but it may occur in younger persons, who, presumably, are free from arteriosclerosis.

Ruptured Aneurysm

In a young, healthy person who, we may learn, has just been shoveling snow or pushing an automobile, the sudden onset of an excruciating occipital headache or of pain behind one eye suggests a ruptured aneurysm. There is often rigidity of the neck, a slow, irregular pulse, and clouding of consciousness. Also there may be backache, legache and a positive Kernig's sign. Paralysis of the third nerve on one side and hemiplegia on the other are commonly present, since such aneurysms usually occur in the circle of Willis. A spinal puncture discloses free blood.

A similar story but with a lateralized headache and often with less evidence of meningeal irritation, in a person with hypertension, suggests a cerebral hemorrhage.

Hypertensive Headaches

An occipital or frontal headache that may be present on awakening but one that does not awaken the patient, a headache that may wear away as the day progresses, that tends to occur daily, then leaves, and then recurs, suggests a hypertensive headache. The behavior of hypertensive headaches is often confusing. An especially disabling headache seems to result from the combination of migraine with hypertensive headaches. In diffuse arteriolar disease with hypertension, group IV, the pressure of the spinal fluid is commonly elevated and there is usually papilledema, but there is not necessarily headache, and spinal drainage may or may not relieve the headache.

In a noteworthy study of seventeen such cases with necropsy, Rosenberg found destructive cerebral lesions in 71 per cent. These included scattered large and small hemorrhages, infarcts of various sizes and numbers, periarteriolar lymphocytic cuffing, suggestive of an inflammatory reaction, gliosis, and local or general edema of the brain. Conceivably any of these lesions may be related to hypertensive headache. The results of treatment may be discouraging. Reduction in physical and emotional tension through constructive advice, rest, sedation, spinal punctures, and venesection may be helpful.

The passive congestion produced by intrathoracic tumors and the distention of the vessels in polycythemia, may cause distressing and persistent headache.

Arteriosclerotic Headaches

Dull, heavy bregmatic or frontal headaches or occasionally stabbing, sharply localized headaches occur in 44 per cent of patients for whom a clinical diagnosis of cerebrospinal arteriosclerosis is warranted. In this group, 64 per cent of patients have an average blood pressure of 130 mm. of mercury systolic and 78 mm. diastolic.

In a review of 100 cases with a pathologic diagnosis of cerebral arteriosclerosis, three times as many had had hypertension as had a normal blood pressure. About one-third of the patients of each of these groups, eliminating those in whom intense headache symptomatic of a terminal massive hemorrhage into the brain had

occurred, had complained of headache. Obviously this is a field deserving of further study.

Headaches Due to Anomalies or Inflammation of the Arteries

A sharply localizing headache of a duration of months or years induced or accentuated by coughing, stooping or straining, may result from some vascular anomaly, such as the passage of an artery through a canal in the bone. Possibly traction on the anchored vessel may be the cause of the pain.

Inflammation of the extracranial arteries may be painful. Excision of the firm and tender vessel may provide immediate relief. Most carefully studied, perhaps, have been those cases of temporal arteritis.⁹ Inflammation and trauma of the superficial nerves may likewise be the cause of distressing headache. Palpation of the skull is so simple a procedure that it is often neglected. The flashing pains of occipital neuralgia ought to be distinguished from the more persistent pains of neuritis, although local anesthetization as a test and section of the offending nerve may be helpful in either case.

Post-traumatic Headaches

Following injuries to the head, often trivial injuries, there may occur persistent local or general headaches, that are usually accentuated by work of any kind. The features may be drawn and careworn or grim and determined. Often there are a sullen demeanor and complaints of giddiness and loss of memory. Too often, alas, the issue is befogged by concern over compensation payments and the records are littered with the documents of solicitors. All of this would be much less disconcerting to the physician if his knowledge of these complaints were greater. A settlement of the claim does not always cure the patient. Fortunately, encephalograms may reveal cortical damage, which, when it is the only objective evidence available, is helpful, but cortical damage does not always parallel the complaints. The therapeutic benefits of encephalography itself are not so commonly achieved as it was at one time hoped.

It is well to note that a fracture of the skull is usually not found with that more serious complication, chronic subdural hematoma. The accelerating tempo with which mental and motor

signs appear when this is present calls for prompt action if a fatality is to be averted.

Toxic Headaches

The throbbing, frontal headache associated with fever is a good example of so-called toxic headaches. Their relationship to some more obvious cause is usually the reason for classifying them as such.

Headaches Associated with Disorders of the Special Sense Organs

"As very characteristic of eyestrain, we include especially frontal and parietal headaches, or an ache in or around the eyeball itself. But occipital and nuchal pain are frequently symptoms of eyestrain, and, at times, eyestrain leads the patient to complain of pain as low down as between the shoulder blades, which, of course, can hardly be thought of as a headache and yet is closely related to it," says Crisp.

When headaches are related to the ear, the history or signs of infection involving this organ usually lead us to consider this possibility. The retro-orbital pain of petrositis and the pain attending epidural abscess may be of long duration. Such situations challenge our courage, since the treatment involves no halfway measures.

The headaches caused by disorders of the nose, sinuses and nasopharynx incidental to infection, ventilation, contacts and tumors may be intense, but when appropriate treatment is given they often disappear at once.²⁵ Such terms as sphenopalatine neuralgia, great superficial petrosal neuralgia, and vidian neuralgia remain confusing to all but those who know what is meant by "typical."

Rheumatic Headaches

A more or less constant, rather superficial pain, often lasting many months, located over the occipital, nuchal, and upper trapezius regions, which may be tender, a pain that is brought on by exposure to a cold draft or by tension of these muscles, and that is relieved by the local application of heat, suggests a nodular, rheumatic, or fibrositic headache. The eradication of foci of infection, local hot packs and heavy massage are helpful.

Headaches Related to Endocrine Dysfunction

Probably often migrainous in their characteristics, headaches related to endocrine activities require further definition. We shall return to these under the heading of migraine.

A continuous, generalized headache may occur with pituitary tumors, even when these have not broken into the cranial cavity. Radiation of the pituitary region may bring quick relief. Rynearson has treated with at least temporary success such a headache of several years standing, by the weekly administration of 25 mg. of male sex hormone. Similar head pains in acromegaly may depend on the same factors that sometimes cause constant pain in the acral parts of the extremities.

Migraine

Commonest of all headaches, with an incidence twice as high in women as in men,¹¹ and generally picking out the ambitious members of society,^{6,27} with hereditary appearance almost the rule, with a history of recurrence over many years, in which the earliest headaches may have been as severe as any of the later ones; headaches that often appear under stress and at the menstrual period, but that may disappear temporarily during pregnancy, and permanently, but not always, at the climacteric; such headaches suggest migraine. The migrainous attack itself is often introduced by warnings, such as scotomas. The headache itself usually occurs on one side of the head but not always on the same side, or in the same location. Vomiting is not a necessary accompaniment. In 90 per cent of such cases, the headache is relieved by the administration of ergotamine tartrate,¹³ which, incidentally, serves to identify it as migraine.

Much has been learned in recent years concerning the cause of these headaches. The common explanation that the pain results from edema of any part of the brain has not been proved. It is known that the larger vessels of the dura and probably adjacent parts of the dura are sensitive, that the larger arteries at the base of the brain are sensitive, that the venous sinuses are probably sensitive,⁴ and that the tentorium may be. The brain itself and the vessels of the brain and pia are not sensitive.³ It seems remarkable that the seventeenth century Willis¹⁷

could write regarding the headaches of Lady Anne Conway, "Certainly it seems most likely, that the invincible and permanent cause so long and yet not deadly Headache proceeds from such a thing, viz., A Scirrhus Distemper of *Dura mater*, the *Pia mater* being in the mean time safe."¹⁷ Obviously there has been little opportunity to investigate the auras of migraine. It seems likely that constriction of the pial arteries accounts for the scotomas and paresthesias. Loss of appreciation of passive movements has been demonstrated during a paresthetic aura. This indicates that more than the dural vessels take part in the attack³ and suggests that the cortical vessels may go into a state of spasm. Subsequently those vessels dilate.¹⁸

While migraine involves a widespread neurovegetative reaction, of which little is known, the pain itself has been studied carefully. With the help of recording devices Graham and Wolff observed that the height of the headache coincides with an excessive pulsation of the temporal artery. They also observed that the injection of ergotamine tartrate, which stimulates smooth muscle, results, not only in the reduction of the headache, but also in the reduction of the amplitude of pulsations of the temporal artery. Direct inspection of the middle meningeal artery revealed that the injection of ergotamine tartrate caused a constriction of 20 per cent in the caliber of this vessel. The caliber of the sylvian artery or vein, however, was not altered. They observed further that manual compression of the temporal, carotid and occipital arteries caused the pain to subside in the regions supplied by these vessels. Ligation of the temporal artery brought about a reduction of pain at the corresponding site. The residual pain probably arose from within the skull. Following the injection of histamine the pulsations increased again and the pain returned to its former location. Histamine itself does not cause the pain since there was no return of pain until after the injection of histamine had been discontinued;⁴ this means that the systemic blood pressure must return before the impact of the column of blood upon the cerebral vessels is sufficient to cause pain. Thus, it would seem that the pain of migraine results from the stretching of relaxed dural arteries by the shock of arterial pulsation.

The pulsation of the cerebrospinal fluid or its pressure could not be correlated directly with the intensity of the pain, nor were these constantly influenced by the injection of ergotamine tartrate. Other observers, however, have reported that a rise in the pressure of the spinal fluid occurs after the injection of ergotamine tartrate.¹⁹ Any increase in pressure of the spinal fluid would, to be sure, tend to support the vessels.⁴

The injection of ergotamine tartrate also increases the blood flow and the oxygen-carrying capacity of the arteries and veins.¹² Possibly this may be correlated with the recent observations of Alvarez that the inhalation of oxygen may relieve migraine, especially if given early.

These observations seem to explain the relief from pain that occurs in 90 per cent of cases following the administration of ergotamine tartrate.¹³ The early administration of 1 mg. given orally twice daily during an attack of pain, or of 0.5 mg. given subcutaneously, gives strikingly good results.²³ Placed under the tongue ergotamine tartrate is much more effective than when swallowed directly.¹⁶ Some observers give as much as 5 mg. orally in a single dose, and 1 to 2 mg. each hour thereafter until a total dose of 10 to 12 mg. in twelve hours has been given.²⁴ The initial subcutaneous dose is generally 0.25 mg.; not more than 0.5 mg. should be given subcutaneously in twelve hours. Contraindications to the use of ergotamine tartrate are coronary disease, peripheral obliterative disease, acute infections, hepatic and deficiency diseases. Gastro-intestinal symptoms, a sensation of pressure in the breast, pain and paresthesias in the limbs may be relieved by the administration of calcium or of atropine.^{16,24}

As an interval treatment ergotamine tartrate is not recommended. Calcium gluconate and viosterol may be prescribed as prophylactic measures, especially for patients who complain of gastro-intestinal symptoms or allergic phenomena.²⁴ Chondroitinsulfuric acid also may be helpful in this situation.¹⁶

Migraine often disappears during pregnancy, when the follicular hormone is circulating. Some patients respond very well to 5 c.c. of amniotin administered orally in three divided doses per day.²³ Progynon has been recommended, particularly for the pale, round faced, fat women in

whom the onset of menses was late, on whom ovarian operations have been performed, or who are in the climacteric.¹⁶ Emmenin also may be administered.

In the treatment of migraine attention should be given to physical and emotional stresses, refractive errors, gastro-intestinal disorders, allergic disturbances,²² and faulty habits of all kinds. Vacations are often helpful. The administration of $\frac{1}{2}$ grain (0.03 gm.) of phenobarbital three times daily over an extended period of time may be useful.

"Erythromelalgia of the Head"

A unilateral headache, without hereditary incidence or an early history of migraine, a headache of sudden onset and termination, in which the pain tends to awaken the patient at night, which is eased by the erect or sitting posture, which is associated with lacrimation and stuffiness of the nostril, and which is often precipitated by taking alcohol, is suggestive of "erythromelalgia of the head." There are no scotomatous or gastro-intestinal accompaniments. The injection of 0.3 mg. of histamine will produce an attack. Desensitization to histamine by the injection twice daily of 0.05 mg. for two days and subsequently increasing the dose to 0.1 mg. for two or three weeks may result in relieving the patient entirely.⁸

Headaches are said to occur occasionally with gastritis. The insertion of a jejunal catheter for feeding may relieve the headaches. The headaches may recur promptly, however, should the catheter slip, inadvertently, into the stomach, as may be determined by fluoroscopy.¹⁴ Gastric dilatation and atony of the stomach during an attack of migraine have been observed roentgenologically.¹⁰

Psychoneurotic, Psychotic, Neurasthenic and Exhaustive Headaches

A headache that has been present constantly for months on end, one that is often poorly and resentfully described by the patient, is suggestive, not of an organic disease, but of a psychiatric disturbance. The sensation of pulling or drawing in the occipital region, or of a weight on the head, is commonly mentioned by patients who are depressed. In hysteria there may be a striking indifference to the headache when subjects

other than the pain are discussed. It is sometimes, no doubt, a means of escaping responsibility.²⁶ In schizophrenia also the complaint of more or less constant discomfort in the head is not unusual.

When headache is the patient's chief complaint, the causes to be considered are almost without number. A thoughtfully taken history should lead one into paths that call for further investigation. A detailed examination may not be neglected. Nor should a careful inquiry into the emotional state, which so often plays a significant role in the production of headache, be disregarded.

Among the more recent advances in our understanding of this common complaint I should mention three. First, the observations made by Wolff and his colleagues, namely, that in migraine an increased arterial thrust upon the toneless but sensitive dural and extracranial arteries is the cause of the pain, and that the administration of ergotamine tartrate, by restoring tone to these vessels, lessens the violence of the pulsations and thus reduces the pain.

Then I should mention the searching studies made by Rosenberg of so-called malignant hypertension, in which he demonstrated the extent of cerebral damage that is associated with this disease.

Finally, reference should be made to the segregation by Horton, MacLean and Craig, of a type of headache that has certain clinical characteristics and that is amenable to desensitization with histamine, and to which they have given the name, erythromelalgia of the head.

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SOME CLINICAL VAGARIES ASSOCIATED WITH BACTERIAL ENDOCARDITIS*

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POSSIBLY only little interest can be aroused by the discussion of a disease such as bacterial endocarditis where therapeutically we are beaten from the start and where the diagnosis appears to be easily made.

The affliction as a rule is readily suspected when the usual criteria of fever, anemia, embolic phenomena and evidence of a damaged heart valve or a congenital heart defect are all present.⁴ When these embolic phenomena are obvious as indicated by petechial hemorrhages in the conjunctiva, fingers or toes, the diagnosis is assured.

However, it is little appreciated that embolic manifestations concealed in deep structures may dominate the clinical picture of this disease and frequently obscure the true nature of the affection. Under these circumstances the correct diagnosis may be missed and only made at necropsy.

During the past few years opportunity has been given me to follow personally with one exception a series of thirteen cases of bacterial endocarditis in which the diagnosis has been conclusively established at the postmortem table. This experience offers rather convincing evidence that we not infrequently fail to make the diagnosis, even under conditions where all diagnostic facilities are available.

It is generally admitted that congenital heart

disease or a previous attack of rheumatic fever predisposes an individual to this affliction.^{4,5,6,7} Usually there have been no recurrent attacks of rheumatic fever and relatively good health has been maintained since the initial infection.⁴ This coincidence has led some writers to the inference that its development is conditioned upon an established immunity to rheumatic fever, because the organisms unable to maintain a continued existence in a highly immune blood stream seek a safe refuge in a platelet thrombus on a damaged heart valve where the blood is unable to penetrate and destroy them.^{4,6,7}

In this series where a positive past history of rheumatic fever was obtained, about eight years of good health preceded the onset of the symptoms of the fatal episode.

The ultimate crippling valve defect of mitral stenosis has been considered the result of a chronic low grade rheumatic infection with recurring episodes of a non-articular character over a considerable period of time.⁷ If so, immunity to rheumatic infection has not been established and upon this foundation one may attempt to explain the relative rarity of mitral stenosis and its associated auricular fibrillation in subacute bacterial endocarditis.

Bell and Clawson believe that rheumatic infection and subacute bacterial endocarditis merely represent different manifestations of the same

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disease.² However, there is little unanimity of opinion as to just what specific organism is the cause of rheumatic fever. *Streptococcus viridans* is the causative organism in the great majority of cases of subacute bacterial endocarditis.^{1,2,5,6} An infection occurs usually upon a previously damaged heart valve.^{1,2} It is generally conceded, however, that it is possible for some bacteria to focalize and continue to survive upon a previously undamaged valve.⁶

One may be permitted to say that a diagnosis of subacute bacterial endocarditis may be dismissed when no murmur is audible unless other characteristic signs of the disease are present.^{4,5,6,7} A murmur may be absent in a rapidly beating heart.

A transient bacteremia without endocarditis may follow tonsillectomy, extraction of teeth or an upper respiratory infection,³ so that a single finding of this organism in the blood stream, unsupported by signs of a past rheumatic infection in the form of a damaged valve, or a congenital heart defect upon which to thrive, is insufficient evidence to support a diagnosis of the subacute variety.⁶ On the other hand the blood culture may remain negative throughout the course of the disease.^{5,6}

The purpose of this paper is to illustrate with selected cases some of the clinical vagaries as well as to show some of the more common features of this disease.

An effort has been made to chart these cases after the method of Keefer³ under headings which are of diagnostic significance and to briefly summarize the associated necropsy findings as determined by Dr. John F. Noble and his associates at the Ancker hospital.

These cases have been grouped according to the presenting symptoms on admission to the hospital.

Group I. Those with symptoms of progressive congestive heart failure.

Group II. Those with symptoms of pneumonia and meningitis.

Group III. Miscellaneous types.

1. Symptoms of angina pectoris and hemoptysis.
2. Those with neurological manifestations
 - a. Hemianesthesia.
 - b. Meningitis.
 - c. Brain abscess.

3. Symptoms of hyperthyroidism with splenomegaly and anemia.

Group I

Cases of subacute bacterial endocarditis with progressive congestive heart failure (Chart I).

There were five patients in this group, three males and two females. Their ages varied from twenty-three to seventy-eight years.

Three gave a past history of rheumatic fever, ten, eight and thirteen years respectively prior to the onset of the terminal infection. They all gave a good subsequent health record and on admission definite signs of rheumatic heart disease in varying stages of congestive failure were present.

Sustained irregular fever and moderate to severe anemia were present in all. Three showed *streptococcus viridans* in the blood stream. In the remaining two, blood cultures were not made. Early embolic phenomena were seen in two cases.

The duration of recorded symptoms before entry varied from one and one-half years to four months, while the longest stay in the hospital was forty-seven days and the shortest four hours.

All showed traces of albumin and occasional red blood cells in the urine. The pathological diagnosis in all cases was subacute bacterial endocarditis, with the heart valves showing evidence of past rheumatic involvement and superimposed soft friable vegetations involving the aortic and mitral leaflets in two and the mitral alone in three cases.

No instance of diffuse glomerular nephritis was found but embolic involvement of the kidneys was common.

Representative of this group with symptoms referable to progressive congestive heart failure is the following case.

Case 3.—Mrs. V. E. A., aged thirty-eight, was admitted to the hospital December 1, 1938. In 1930, this patient had rheumatic fever characterized by a migratory polyarthritis. She never had symptoms of decompensation following the attack. Four years ago following the onset of a chronic cough, she noted on one occasion a blood-streaked sputum. One and a half years ago the patient developed a progressive weakness and pain and tenderness in her legs. Six months later she noted pleurisy in her right chest which was located under the shoulder blade. June 15, 1938, the patient developed coryza. Since that time she had a productive cough which increased in severity. The sputum was at

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times blood-streaked. She had recurrent chills and fever and severe night sweats until the time of her admission to the hospital. Three weeks before her admission her legs, ankles, and feet became edematous and she noted some dyspnea on exertion, and palpitation of the heart. The urine was at times coffee-colored and she had some dysuria. She lost ten pounds

faint trace of albumin, occasional casts, a few leukocytes, but no red blood cells were ever found. The hemoglobin was 54-36 per cent; leukocytes, 10,200 and 31,100. The polymorphonuclears were 77-94 per cent with toxic cells seen at one time. The sedimentation rate was 80 mm. per hour. The urea nitrogen, 32.2 milligrams and creatinine 1.8 milligrams.

CHART I. CASES OF SUBACUTE BACTERIAL ENDOCARDITIS WITH PROGRESSIVE CONGESTIVE HEART FAILURE.

Age Sex Name	Previous Rheumatic History	Subsequent Health Condition	A D M. Diagnosis	Signs of Damaged Valves	Signs of Infection	Signs of Embolic Phenom.	Signs of Heart Failure	Blood Findings Culture	Duration Hosp. Days	Necropsy Findings
1. G.K. 23yr. M.	one attack severe 10 yr. ago	very good	Subac. B.E. Combined Rh. Val. Dis.	Sys. Dias. Murmurs A.o. and M.	irreg. temp 98°-103° P. 100-130	Petechial hems. Terminal hemiplegia	Bilateral Hydrothorax Reg. rhy.	Pos. Bld. C. Str. Vir. Hg. 62% RBC 3.4M WBC 11,500	4 mo 34 days in Hosp.	Vegs. Ao. M.V. Inf. Brain & softening Inf. Sp. Kid. Bilat. Hydrothorax
2. E.W. 78yr. F.	patient irrational	not known	Rheum. Ht. dis. & cong. fail.	Dias. and Sys. Murm. at apex	no temp. on one reading P. 110.	none	Orthopnea Pitting edema of extremities Irrig. rhy.	not made	4 hr. in Hosp.	Vegs. Mitral. Val. Stenosis Inf. A. Lg. Old Inf. Liver - Spleen Kidney
3. VEA. 38yr. F.	one attack 8 yr. ago syphilis 17 yr. ago	good until 12 yr. ago	Rheum. Ht. dis. & cong. fail.	Dias. and Sys. Murm. over precordium B.P. 125/38	chills & temp. 98°-104°	none	Edema Legs Basal dullness of Lgs. Basal rales Auv. Fib.	Pos. Bld. C. Str. Vir. Hg. 54.36% WBC 10,200 WBC 31,100 BUN 32.2MG	1/2 yr. 47 da. in Hosp.	Vegs. Ao. M.V. Inf. left vent. wall Cult. Ht. Thrombus Str. Vir. Acute Splenitis Bilat. Hydroth.
4. C.P. 39yr. M.	one attack 13 yr. ago	good worked as a laborer	Rheum. Ht. dis. & cong. fail.	loud syst. mur. over prec. B.P. 120/80	irreg. course, 98.8-102.3	none	Edema Legs Basal dullness of Lgs. Dyspnea + Cyanosis +	Bld. C. not m. Hg. 60.75% RBC - 5.1M WBC - 7500	6 wks 10 da. in Hosp.	Vegs. Mit. V. & Stenosis Old Aortic defect Ball thrombus in Left Auricle Bil. Hydrothorax
5. C.H. 51yr. M.	none	good except for obstructive bladder symp. 10 yr.	Rheum. Ht. dis. enlarged prostate	loud syst. precord murmur	temp. 98°-103°	Petechial hems. on extremities and conjunctiva	Moderate congestion of Lungs Reg. rhy.	B.C. Pos. Str. Vir. Hg. 60.50% RBC 3.626M WBC 13,000 WBC 62000	5 mo 35 da. in Hosp.	Vegs. Mitral. Val. and R. Auricle Inf. Myocardium Bil. congestion of Lungs Liver and Spleen

in weight since June, 1938. Her past history revealed that the patient had chickenpox and diphtheria as a child. Seventeen years ago she contracted syphilis. This was characterized by primary and secondary lesions. She was treated with mercury for a short time. For the past four years she has been treated continuously for syphilis. Her husband died of syphilis. She came in contact with tuberculosis on one occasion.

Physical examination revealed that the patient was underdeveloped and emaciated. She did not appear acutely ill. The blood pressure was 123 over 38, temperature 102.4°, and pulse 100. The skin was pale and moist. The right pupil was larger than the left and neither pupil reacted to light. Examination of the fundi was negative. The breath sounds were found to be decreased on the right and there were a few râles present in the left base of the lung field. The heart was enlarged to the left and there was a rough systolic and a soft prolonged diastolic murmur heard over the entire precordium but most marked at the second left interspace. The heart rate was irregular and numerous extrasystoles were heard. The spleen was not palpable. There was no tenderness nor rigidity in the abdomen. Examination of the extremities showed a slight clubbing of the finger tips. There were ecchymotic areas over the anterior surfaces of both thighs.

Laboratory examinations: The urine contained a

The serum globulin was 1.4 grams; albumin, 3.22 grams, and the sulphanilamide determination on January 6, 1939, was 9.3 milligrams per 100 cc. of blood. Examination of the sputum was negative for tubercle bacilli. Of five blood cultures taken, one was positive for streptococcus viridans. The icteric index was eight and the VandenBergh .1 milligram bilirubin. The blood smears were negative for malaria. The agglutinations were negative. The blood Wassermann was 4+.

The electrocardiogram showed auricular fibrillation, right axis deviation, and ventricular muscle damage. The x-ray examination of the chest showed the heart to equal 60 per cent. There was a generalized enlargement with straightening of its left border and prominence of the conus pulmonalis. There was thickening of the interlobar pleura on the right and increased bronchovesicular markings. Later x-ray showed an increased enlargement of the heart with congestion of both lungs. There was an area of consolidation in the lower portion of the right lung due to pneumonia or infarct.

The patient's clinical course was characterized by cough, night sweats, and occasional chills with a moderately high fever. The temperature ranged from subnormal to 104°. It was mainly irregular but was at times typically septic. The heart continued to fibrillate. Two weeks after admission the patient developed

edema of the legs and râles were heard in the chest. On December 19, 1938, the blood culture was positive for streptococcus viridans. Neoprontosil was then given for two weeks and was followed by prontosil. She was very emotional and at times confused and irritable. Weakness and listlessness were pronounced. She was cyanotic and finally became involuntary. Her temperature terminally was subnormal. No petechiæ were ever found on any portion of the body. The patient expired January 17, 1939.

Necropsy findings—as determined by Dr. John F. Noble:

Diagnosis: (1) Old valve defect (mitral). (2) Old valve defect (aortic). (3) Subacute bacterial endocarditis (mitral, aortic, and left ventricular wall). (4) Thrombosis (purulent) of left auricular appendage and auricle. (5) Bilateral hydrothorax. (6) Ascites. (7) Pericardial effusion. (8) Bilateral atelectasis of the lungs. (9) Thrombosis and infarction of left lung. (10) Passive congestion of lungs-liver-spleen-kidneys. (11) Acute splenitis.

Note: Culture from the septic thrombus of the heart at autopsy shows streptococcus viridans.

Comment. This is a case of subacute bacterial endocarditis occurring in a patient with definite mitral stenosis and auricular fibrillation giving a past history of rheumatic fever eight years previously followed by a relatively good health period, without cardiac failure, until the onset one and one-half year before death of symptoms of recurrent chills, fever and night sweats, terminating seven months after onset in progressive congestive heart failure, auricular fibrillation and marked edema.

This patient failed to respond to sulphanilamide therapy.

Group II

Cases of bacterial endocarditis with acute septic onset with symptoms of pneumonia and meningitis (Chart II).

Not infrequently a patient enters the hospital with symptoms of an acute fulminating infection, suggestive of pneumonia and terminating as a meningitis, or with meningeal symptoms from the start.

Of these there were four patients, three males and one female. One was fifty-one years old, one sixty and two were twenty-four years old.

None of these gave a previous history of rheumatic fever and in only one was a heart murmur heard. The heart was definitely enlarged in two and the rate was rapid in all. The onset was acute, following apparent good health, with

chills, high fever, delirium and signs of meningeal irritation. On admission to the hospital the clinical diagnosis was pneumonia and meningitis.

The temperature was septic and the anemia was not significant. Three presented suggestive embolic signs. The blood culture was negative in one and not made in the others.

The duration of symptoms before entry ranged from two weeks to two days while the stay in the hospital of two patients was twenty-four hours and thirty-six hours and the others nine days and twelve days respectively.

Subacute bacterial endocarditis was found in three cases and the infection was acute in one. The mitral leaflets were involved in two and the aortic in one case. Bronchopneumonia, infarcts and petechial hemorrhages in the brain were seen in the two cases with meningeal symptoms. One patient had a syphilitic aortitis without a syphilitic valvulitis. The aortic leaflet showed a rheumatic deformity with a superimposed bacterial endocarditis.

The case of acute bacterial endocarditis occurred in a woman. The aortic leaflet disclosed evidence of rheumatic involvement and the mitral leaflet a very large, soft, friable vegetation. The uterus was normal in size and its endometrium absolutely smooth.

The following are two illustrative cases.

Case 1. W. S., aged sixty, white, male, admitted to the hospital August 4, 1938. Five days before admission he had become acutely ill with a cough and developed chills, fever and generalized weakness. He was treated by a local physician for a few days. During this period he had coughed mucus but no blood. He did not have any chest pain. His appetite had been poor and he had been constipated during the present illness. Previous to the present complaint he had been well.

Physical examination at the time of admission disclosed an acutely ill, elderly white male whose temperature was 104°, pulse 118, and blood pressure 130 over 70. Examination of the chest revealed the respiratory rate to be 26 with dullness to percussion over the left postero-lateral aspect of the chest. Some bronchial breathing was heard at this site. There were many râles anteriorly in the left chest. Occasional râles were heard in the left base. The heart was rapid; no murmurs were recorded. Examination of the abdomen revealed it to be tympanitic with no palpable masses or tenderness. The liver edge was palpable but not tender. There were a few superficial abrasions about the trunk.

The urine showed albumin, granular casts and a few white and red blood cells. The sputum was negative for pneumococcus. The hemoglobin was 80 per cent

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and the white blood cells 15,000, of which 89 per cent were polymorphonuclears. The sedimentation rate was 95 millimeters in one hour. The blood urea nitrogen on admission was 60.2 milligrams per cent.

On the following day the patient was lethargic, confused and answered questions with difficulty. There was some neck rigidity. His temperature had increased

atheromatous streaking. The auricular appendages contain no thrombi. The ventricular walls are definitely thicker than normal and there is some dilatation. Microscopic examination of sections of the heart valves shows them to be composed for the most part of connective tissue fibers forming a dense plate."

Head: "Examination of the head shows the sub-

CHART II. CASES OF BACTERIAL ENDOCARDITIS—ACUTE SEPTIC ONSET, WITH SYMPTOMS OF PNEUMONIA AND MENINGITIS.

Age Sex Name	Previous Rheumatic History	Subsequent Health Condition	ADM. Diagnosis	Signs of Damaged Valves	Signs of Infection	Signs of Embolic Phenom.	Signs of Heart Failure	Blood Findings Culture	Dur- ation Hosp Days	Necropsy Findings
H.E. 24yr. M.	None Tonsillectomy 8 mo. ago for Heart Dis.	Good except Ht. palpitation married 10 da. ago	Pneumonia Meningitis Acute onset delerium and fever	Ht. enlarged no murmur Rate Rapid	Rigid neck Pos. Kernig Pos. Babinski Temp. 102-106 P. 100-160	None	None no past Edema	B. Cul. N.M. WBC 14,500 Sp. Fid. Cell. ct. 88	2 days 24 hours in hosp.	Subac. B.E. veg. on mitral valve Hem. Bronchopn. Inf. Liv., Spl. + K. Petechiae. Brain Infarct. Brain
R.C. 51yr. M.	None Pneumonia and Pleurisy 9 yr. ago	Frequent Respiratory infections and Pleurisy	Pneumonia Acute onset with chills and fever	Ht. enlarged 62 L. inter-Sp. no murmurs BP. 135/80	Temp. 101-104 P. 90-130 irrational	R. Thumb	None	Hg. 70% RBC 3.7M WBC 17,400 8 L.B. Wass. 4+ Culture neg	13 days 9 days in hosp.	Subac. Bact. Endo. vegs. aortic valve Syphilitic aortitis Purulent pericard. Bronchopneumonia Inf. Spln. + Kidys.
Mrs. E.L.G. 24yr. F.	None	Well	Pneumonia acute onset with chills and fever	Syst. mur. to left axilla	Septic temp. 99.5-105 P. 112	Change in character of Ht. murmur	Pro- gressive Edema of Lungs	Hg. 60% RBC 3.2M WBC 12,600 B. Cul. N.M.	2 wks. 12 days in hosp.	Ac. Bact. Endo. Aortic v. firm veg. Mitral v. soft vegs. Edema of Lungs Chr. supp. salpingitis Cul. tubc. B. Coli. Hemolytic Staph.
W.S. 60yr. M.	None obtained	No past history obtained	Pneumonia meningitis	No murmur puls 120 R. 26 BP 130/20	Temp. 104-106 P. 120-148 R. 26 Lethargic Kernig + Neck mod. stiff	Petechial hems. Conjunctiva Extremities	None	Hg. 80% WBC 15,000 B.U.M. 60 mg% B. Cul. n.m.	5 days 36 hours in hosp.	Subac. Bact. Endo. ulceration, mit. leaf. old valve defect (mitr) Bilat. Bronchopn. Petechial hems. In Brain, Kidney + Int.

to 104.8. The respiratory rate remained the same and his pulse increased to 130. There was a positive Kernig's sign and the spinal fluid was bloody with 266 cells per cu. mm., 94 per cent being polymorphonuclears. He became progressively worse. The treatment consisted of sulphanilamide. His temperature rose to 106.4° and on the following day he died approximately thirty-six hours after admission.

Notes—Drs. Maun and Dick on the heart and head:

Heart: "The heart weighs 525 grams. The tricuspid, pulmonic, and aortic valves are normal in appearance. Examination of the mitral valve reveals the leaflets to be slightly thicker than normal and somewhat opaque. There is slight contraction in the leaflets. Examination of the leaflet of the mitral valve reveals it to be thickened and in the center of it there is a soft necrotic area which has perforated the valve. This measures approximately one centimeter in diameter. About it, the valve is soft, edematous, and slightly red in color. There are no free vegetations on the margins of the valves. The coronary arteries are normal in appearance. The myocardium is firm and on cut section it is swollen and cloudy in appearance.

"Scattered throughout the ventricle there are small light yellowish areas which do not appear to be connective tissue. There is no gross evidence of excess fat. The root of the aorta shows a mild degree of

aponeurotic surface of the scalp to be ecchymotic over the vertex on the right side and the calvarium shows nothing of note. The surface of the brain shows a number of petechial hemorrhages of varying sizes distributed uniformly over the brain surface. On cut section there are numerous petechiae of varying sizes throughout the gray and white matter involving the falx cerebri, and cerebellum. There are larger areas in the brain substance measuring up to .5 centimeter in diameter. These are essentially in the right parietal lobe, the right occipital lobe, four in the parietal lobe, and several are seen in the white matter of the cerebellum. At approximately the junction of the occipital and parietal lobes in the right cerebral hemisphere is seen an area of softening, which surrounds one of these ecchymotic areas described. There is no other evidence of tumor, hemorrhage or softening."

Diagnosis (Necropsy)—(Drs. Mark Maun and Fred Dick): (1) Subacute bacterial endocarditis. (2) Old valve defect (mitral). (3) Bilateral bronchopneumonia. (4) Infarction of kidneys—brain. (5) Emboli—gastrointestinal tract.

Case 2. H. E.—This patient was a white man aged twenty-four who was admitted to the hospital on August 30, 1939, at 7:44 p.m. He was delirious and in a semi-conscious condition. The history was obtained from his wife. He had been married ten days ago and had

been perfectly well until August 28, when he complained of pain in his stomach after eating. That night his wife was awakened at 12:00 P.M. and found that he did not recognize her. He was delirious and remained so until his admission to the hospital. Two days after onset he coughed considerably and complained of a violent headache. He was very restless. Nausea and vomiting occurred. A doctor was called on August 30 and diagnosed the case as pneumonia.

His tonsils had been removed at a local hospital last fall. His wife said that he had had heart trouble and for that reason was kept in the hospital several weeks after his tonsils were removed. He had been short of breath on exertion and had had palpitation of the heart but never edema of the feet or ankles. He also had had frequent colds and a chronic unproductive cough.

Physical examination showed the pupils to react sluggishly to light. There was a slight discharge from the nose. The chest showed numerous coarse rhonchi throughout. Posteriorly, there was dullness at the right lung base. The heart was enlarged to the left, the apex being in the seventh interspace in the anterior axillary line. There were no murmurs. The rate was rapid. The abdomen was distended. The legs and ankles showed multiple areas of brownish pigmentation. There was marked rigidity of the neck. The Kernig was positive, and the Babinski was positive on the left. The knee jerks were decreased. There was no clonus.

A spinal puncture was done and 20 c.c. of fluid was removed under increased pressure. The cell count was 88. The white blood cells were 14,500. He bled from his nose and mouth. The temperature varied from 102 to 106; the pulse from 100 to 160. He died twenty-four hours after admittance.

Notes—on the heart and brain by Dr. John F. Noble:

Heart: "The heart weighs 361 grams. The tricuspid, pulmonary and aortic leaflets are normal in appearance. The mitral leaflets appear about normal in thickness, and there is no definite evidence of a past infection on inspection. Along its free superior surface of one leaflet there are large, raised, soft, friable, thrombotic lesions. These are continuous over the entire upper surface of the upper valve along the point of contact. The coronary vessels show nothing of note. The myocardium is pale and swollen in appearance, and shows small fatty looking areas. At the tip of the left ventricle, the muscle shows an opaque white spot which appears to be scarring. The root of the aorta shows a mild degree of atheromatous streaking."

Head: "Examination of the brain shows no definite evidence of meningitis save in the parietal lobe of the left hemisphere where there is a small but definite area of infarction, the center of which is yellow. This measures about 5 mm. in diameter. On cut section the brain shows numerous petechial hemorrhages particularly in the white substance, and in some places involves, to a less degree, the cortex. There is no gross evidence of hemorrhage or softening. The cerebral vessels show nothing of note."

Diagnosis (Necropsy)—(Drs. J. F. Noble and C. H. Drenkhahn): (1) Subacute bacterial endocarditis, mi-

tral. (2) Hemorrhagic bronchopneumonia, bilateral. (3) Infarction of the liver, kidneys, spleen and brain. (4) Cloudy swelling of the heart, liver and kidneys.

Briefly summarized we have two patients with subacute endocarditis without demonstrable heart murmurs, possibly because of the rapid heart action, entering the hospital with signs and symptoms of pneumonia and meningitis, who die shortly after admission, one in two days and the other in twenty-four hours, both of whom give a past history of their usual state of apparent good health until the onset of the symptoms initiating the terminal event.

The speed of the fatal developments in these cases suggests that the insidious nature of this disease permits the patient to continue at his daily work for an indeterminate period until a major embolic accident interrupts the even course of the affliction.

As a result the true nature of the condition is unsuspected and the diagnosis comes as a surprise at necropsy.

Group III

This is a miscellaneous group and included three patients whose presenting symptoms also depended upon the early localization of major embolic phenomena.

1. Severe gastro-intestinal symptoms terminating in right hemiplegia.

2. Symptoms of angina pectoris and hemoptysis with sudden and unsuspected death.

3. Sudden onset with right hemianesthesia.

Two of these patients had a previous rheumatic history occurring ten and eight years previously and one an osteomyelitis twenty years before.

Each had enjoyed good health until the onset of his present complaint.

Definite evidence of valvular heart disease, signs of infection and moderate anemia were present in all, while two displayed embolic phenomena. Blood culture was positive in one case. The symptoms at onset were sudden and their character determined by the localization of emboli.

Case 1. P. O. T. complained of abdominal pain, nausea and vomiting and after forty-five days in the hospital he was suddenly seized with severe abdominal pain, became pulseless and died shortly afterwards.

At autopsy, about 1,500 c.c. of fluid blood was found in his peritoneal cavity due to a ruptured mycotic

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aneurysm of a branch of the mesenteric artery, the cause of which was a subacute bacterial endocarditis.

This patient had three negative blood cultures.

Case 2. R. W. had complained of moderate angina on effort for three months. He continued working until ten days before admission, when he had hemoptysis and

of twenty-four, eight years prior to his admission and developed a stricture which had been dilated three times in the eight-year interval. During this period he had several exacerbations of gonorrhea and also complained of difficulty in micturition.

Examination: The patient was not acutely ill. A blowing systolic murmur was heard at the apex. The

CHART III. CASES OF SUBACUTE BACTERIAL ENDOCARDITIS.

Age Sex Name	Previous Rheumatic History	Subsequent Health Condition	ADM Diagnosis	Signs of Damaged Valves	Signs of Infection	Signs of Embolic Phenom	Signs of Heart Failure	Blood Findings Culture	Duration Hospital Days	Necropsy Findings
Severe Gastro-Intestinal Symptoms Terminating in Right Hemiplegia										
P.O.T. 23 yr. M.	Yes 10 yrs. ago	Good Baseball Player	Subac. BE with abd. symp. abd. pain nausea and vomiting	Low basal syst. diast. murmurs Low syst. at apex	Daily Septic temp. 101-104	Early Petechiae in Crops Fingers, ft. Terminal R. Hemiplegia	Heart 60 % Liver palp.	Hg. 60 % RBC-3.6M. WBC-20000 Wass. 4 + 3 neg. Bld. Culs.	2 mo. 45 days in hosp.	Subac. BE. Old val. def. Ao. + M. C soft vegs. Inf. Brain. Lgs. Spl. Petechiae G. Int. Tr. Rupture mycotic aneur. Of Mesenteric Vessel Hemoperitoneum
Symptoms of Angina Pectoris and Hemoptysis with sudden and unexpected death										
R.W. 51 yr. M.	None Osteo- myelitis 20 yrs. ago	Good 10 da. ago Hemoptysis Angina pect. Severe	Rheumatic heart disease	Low Syst. murm. lower precordium trans. lax.	temp. 100 % P. 90-	None	Sudden unexpected death Liver +	Hg. 75 % RBC-4.1M WBC-12,500	10 days 2 days in hosp.	Sub. BE. Aortic V. Ulceration Ao. V. Old valve defect mit. Septic emboli. R.C.A. Septic inf. myoc. Spl. Bilateral hydrothorax
Sudden onset with right hemianesthesia										
L.E.S. 18 yr. F.	Yes 8 yrs. ago	Good	Rheum. Ht. Disease Hemi- anesthesia	Systolic murmur at apex	Remittent temp. 102 P. 90-120	Late Petechial hem. finger and foot	None	Hg. 70 % 58 % RBC-4.5M WBC-17000 3 Bld. cult. + Strept. vir.	1 Day 28 days in hosp.	Recent case Living

a severe attack of anginal pain which necessitated hospitalization. While apparently in good condition, he suddenly and unexpectedly died, two days after his entry.

At autopsy, "the right main branch of the coronary artery in its distal portion where it supplies the septum between the right and left ventricles shows a definite thrombosis and in the region of the septum near the auricular ventricular sulcus, there is a definite abscess formation and the entire wall of the left ventricle in proximity to the septum shows a large, well-defined yellowish area of infarction. A soft ulcerative thrombotic vegetation is found on the aortic leaflet to be exactly opposite the orifice of the right coronary artery."

The following two cases are of sufficient interest to merit a more detailed history of their symptoms, progress and autopsy findings. They carry a more practical significance than the more common types of the disease just cited and illustrate the value of alertness in recognizing the possibility of multiple embolic manifestations as a causative factor in obscure and uncertain clinical pictures.

Case 3. P. R. F., male, aged thirty-six, last entered the hospital April 8, 1938. His first admission was in July, 1934, when he complained of a severe pain in the sacro-iliac area, making it almost impossible for him to walk. He had acquired gonorrhea at the age

prostate was slightly enlarged and on massage pus could be expressed from the urethra.

The sacro-iliac region was acutely inflamed and a diagnosis of an acute arthritis was made.

The blood, including Wassermann, was normal, the urine negative except for a faint trace of albumin and the sedimentation rate was 78 millimeters per hour.

He left the hospital markedly improved, but he re-entered the hospital five months later (November, 1934) complaining of inability to think clearly, shooting pains in the head, both of four days duration. He said that while driving an automobile he lost control of it and that he had also noted a slight loss of memory for recent events.

The patient showed a delay in his answers and was slow mentally. His memory was poor and he had difficulty naming objects. The blood pressure in the right arm was 76 over 50 and the left arm 134 over 70. There was a weakness of the left facial muscles and a dilated right pupil. A systolic apical murmur was heard. The blood picture was again normal. The urine examination showed a faint trace of albumin. A radiograph of the skull was negative and one of the chest showed the heart to have a 50 per cent cardiothoracic ratio with an increased prominence in the left auricular area.

He left the hospital under protest and was next seen in the out-patient department in 1935, when he com-

plained of photophobia. The fundus examination at this time was negative.

He was readmitted to the hospital in November, 1936, in a stuporous condition. From relatives it was learned that since his last admission in 1935 he had been in an auto accident and had been unconscious for a short period. He remained well for a short time but later began to lose his memory and his condition gradually progressed until he became semi-stuporous.

Examination on this admission revealed his blood pressure, temperature and pulse to be within normal limits. The pupils were dilated, fixed and equal. He gave unintelligent answers to questions. There was a slight rigidity of the neck while the Kernig and Babinski signs were positive bilaterally. The deep reflexes were slightly increased. An apical systolic murmur was again noted. The spinal fluid was cloudy and contained a trace of globulin. There were 495 cells present. The colloidal gold curve was negative. Subsequent examination showed 296 cells with 97 per cent polymorphonuclears. The sedimentation rate was 46 millimeters and the visual field normal. X-ray of the skull showed an irregular mottling in the left frontal area. The tongue deviated slightly to the left and the deep reflexes were increased. He had a left sensory aphasia and was unable to execute orders. The spinal fluid cell count gradually dropped to 16 cells. Occasional slight exacerbations of a low grade constant temperature were present. A diagnosis of a chronic brain abscess in the left temporal area was made.

After six months he had improved markedly and was discharged from the hospital, but four months later was again readmitted with similar complaint. At this time the hemoglobin was 55 per cent, the W. B. C. 7,000 and a normal differential count was present. The urine examination showed a faint to a heavy trace of albumin with an occasional hyaline and granular cast, many leukocytes, and a few erythrocytes. The spinal fluid disclosed a faint trace of globulin, one cell and a typical parietic curve. He was discharged in an unimproved condition.

About six months later on April 8, 1938, he again entered the hospital for the last time. He had fallen out of his bed and was unable to give an intelligent history of previous events.

His blood pressure was 128 over 88, temperature 98.2°, and pulse rate 120. There was a sutured laceration at the left parietal area. The pupils reacted to light and accommodation. The apex beat was palpated two centimeters to the left of the nipple line and a systolic murmur was heard which was transmitted to the axilla. A number of râles were present over the chest. His blood showed a 26 per cent hemoglobin and 1,400,000 erythrocytes and 11,000 leukocytes. He continued to fail rapidly, and expired April 10, 1938, two days after his admission to the hospital.

Necropsy notes by Dr. John F. Noble:

Heart: "The heart weighs 420 grams. The aortic, tricuspid, pulmonic valves are normal in appearance. Examination of the mitral valve reveals a slight thickening of the free margin with a number of soft friable vegetations particularly on the auricular surface. These

vegetations apparently extend from an ante-mortem adherent mural thrombus and this is seen in the left auricle. It is extremely soft in consistency and appears to be recent in origin. The coronary vessels are normal in appearance. The myocardium is somewhat flabby and on cut section is swollen and cloudy in appearance. Near the posterior aspect of the left ventricle there is a large area of fibrosis measuring approximately one centimeter in diameter. Scattered throughout the posterior aspect of the left ventricle there are also several smaller areas of fibrosis. There is no gross evidence of excess fat. The root of the aorta is free from atheromatous streaking. The auricular appendages show no thrombi.

"Microscopic sections of the heart muscle show numerous areas in which the fibers are replaced by connective tissue and fat. These areas are invaded by a small number of chronic inflammatory cells showing evidence that this was probably the site of old inflammation that was probably rheumatic in nature. Sections of the heart and the mural endocardium adjacent to the mitral valve show a similar process with the heart fibers. The endocardium and the portion of the valves shown in this section shows the valves to be markedly thickened and fibrous in nature. This thickening is produced by connective tissue and the presence of a large number of chronic inflammatory cells invading it. Here and there the valves show a few foci of inflammatory cells, which are close to the free margin. This appears to be a more acute process. Along the free margin one can also find round bacteria occurring in strings which are apparently streptococci. The free margin of the valve also shows definite palisading of the inflammatory cells occurring there. These would undoubtedly be histiocytes. This process is to some extent related to the small foci of inflammatory cells. Attached along the margin of the valve one can also see pink-staining homogeneous masses which represent thrombi. The entire process would suggest that the patient had an old rheumatic process producing myocardial damage. It was followed by a long continued rather low grade endocarditis and a terminal acute bacterial endocarditis superimposed upon the latter process."

Head: "On opening the head there is seen to be the previously mentioned laceration in the lateral aspect of the left frontal area. The calvarium shows nothing of note. On opening the dura there is found to be a small amount of adherent blood to the undersurface of the dura in both the anterior, middle and posterior fossa. The blood, however, appears to be recent in origin and can be easily pushed from the dura with the examining finger. There is no evidence of organization in it. Examination of the cerebral surfaces of the hemispheres reveals a deep pit in the left parietal area. On cut section the cut surface of the left cerebral hemisphere shows the frontal lobe to be normal. On cut section through the parietal area there is a large area of softening extending throughout the entire parietal lobe and partially into the occipital lobe. This area lies in the lateral aspect of the lenticular nucleus and in the gray substance of the brain. In its largest area it measures approximately 2 c.c. in diameter. At

one point in the parietal lobe it encroached upon the cortex to produce the deep pits previously mentioned. At the midportion it resembles an abscess cavity but the wall of it is irregular and could be produced by simple infarction. Examination of the right cerebral hemisphere reveals a similar area of softening in the parietal lobe lying lateral to the lenticular nucleus. It is much smaller and measures approximately one centimeter in diameter. It only extends through the distance of several convolutions. Further examination of the brain reveals no evidence of hemorrhage or tumor mass. The middle ears and mastoids are normal in appearance. There is no evidence of skull fracture. Examination of the entire cranial vault shows no evidence of erosion or tumor mass.

"Examination of the brain reveals the meninges to be markedly thicker than normal and they are somewhat hyaline in character. There is a faint trace of fluid beneath the arachnoids. Sections of the brain in the region of the abscesses show them to be infarcted. The entire parenchyma of the brain shows a rather marked degree of gliosis and the areas about the vessels show small collars of round cells. In some sections the vessel walls themselves appear to have thickened. The entire process suggests a chronic inflammation."

Cultures of autopsy:

1. Diphtheroid bacilli in the abscesses of spleen.
2. Hemolytic streptococci in the prostatic abscess and in the brain.

All cultures are negative for gonococci.

Diagnosis: (necropsy)—Drs. J. F. Noble and Mark Maun: (1) Prostatic abscess. (2) Splenic abscess. (3) Bacterial endocarditis. (4) Mural thrombus. (5) Cerebral malacia (bilateral infarction). (6) Infarction of kidneys. (7) Bilateral confluent bronchopneumonia. (8) Old cholecystectomy. (9) Appendectomy. (10) Subdural hemorrhage.

Comment. Here is a patient with a definite systolic heart murmur, signs of infection and severe anemia, who for a period of four years had signs and symptoms of intracranial pathology diagnosed as a primary cerebral abscess, who at autopsy shows conclusive evidence of an old rheumatic valvulitis with a superimposed bacterial endocarditis and multiple infarction of the brain with necrosis.

At the present time evidence exists that all cases of endocarditis lenta do not inevitably die, but that recovery occasionally takes place.⁵ The usual duration before its fatal outcome is considered to be from six months to one year.^{4,6,7}

Many cases are observed in large city hospitals where patients frequently delay entry until absolute necessity makes them seek relief and then death quickly occurs.

Undoubtedly a not inconsiderable number continue at their daily work in an active stage of

the disease, often without medical attention or with an incorrect diagnosis. Some of these may go into a spontaneous remission but after an indeterminate period of time relapse again into an active stage of the disease with fatal results.

The duration of four years in this patient suggests such a possibility.

Case 4. W. J. L., male, white, aged fifty-five, entered the hospital October 10, 1937, died October 28, 1937, eighteen days later. On admission the patient did not give a clear history. He said that he had noted nervousness, a tremor of the hands, weakness, insomnia and palpitation of his heart for a period of about ten years. His physician had considered his condition to be due to a toxic goiter. A subtotal thyroidectomy had been performed in 1935 without apparent relief of symptoms. Another thyroidectomy was done in May, 1937, shortly before admission. This also failed to give him relief. He then received two courses of deep x-ray therapy. The last course was given in September, 1937, shortly before his entry in the hospital. He stated that he had lost 60 pounds in weight during the past ten months. No definite history of rheumatic fever was obtained.

He was an undernourished white male lying restlessly in bed. He was not acutely ill. The blood pressure was 130 over 40. The pulse rate 132 and the temperature 100° on one occasion; otherwise normal during his hospital stay. The left pupil was irregular and smaller than the right. Both reacted to light. The ocular fundi disclosed numerous small hemorrhages throughout. In the left there was a large hemorrhage superior and nasal to the disc. The heart was enlarged to the left on percussion. No thrill was palpated. A soft systolic and diastolic murmur was heard over the aortic area. A positive Duroziez's sign and a Corrigan pulse was elicited. A soft round liver edge and the spleen could be palpated about three inches below the costal margin.

The hemoglobin varied between 36 and 46 per cent and the red blood count was 1,600,000 cells. The leukocyte count was 6,000 and 14,000 cells and differential count was not significant. The blood smears disclosed some anisocytosis and some hyperchromasia. The blood Wassermann was negative but the flocculation was positive on two occasions. The icteric index was five. The basal-metabolic rate was plus 35 per cent. The urine showed a faint trace to a heavy trace of albumin with an occasional hyaline and granular cast and a few leukocytes and red blood cells in all specimens examined. X-ray examination of the abdomen showed enlargement of the spleen and liver. The cardio-thoracic ratio was 53 per cent and there was considerable congestion in both lungs. Throughout his entire hospital course, the patient was somewhat disoriented. He developed moderate pitting edema of the extremities and died on October 28, 1937.

Notes by Dr. J. F. Noble on the heart: "The heart weighs 547 grams. Examination of the aortic valve shows two of the aortic leaflets to be firmly sealed

together, definitely shortened and calcified. Along the free margins of the aortic leaflets there are numerous raised grayish friable vegetations. The mitral leaflet of the aortic valve shows the largest mass of vegetations and this process has completely destroyed the leaflet, undoubtedly causing an insufficient valve. The mitral leaflets appear to have been normal except for an acute process seen on them. Here the vegetations are somewhat smaller but still thrombotic in appearance and friable in consistency. The tricuspid and pulmonary leaflets show nothing of note."

Diagnosis: (necropsy)—Drs. J. F. Noble and Mark Maun: (1) Subacute bacterial endocarditis. (2) Fibrinous pericarditis. (3) Infarction of the myocardium and spleen. (4) Lobar pneumonia (right). (5) Fibrinous pleuritis (right). (6) Old pleural adhesions (right). (7) Cloudy swelling of heart-liver-kidneys. (8) Splenitis. (9) Edema. (10) Congestion of liver.

Comment. A case of subacute bacterial endocarditis with splenomegaly and anemia terminating in congestive heart failure and pneumonia was diagnosed within a year of death as a toxic goiter. One thyroidectomy was performed about a year and the second one four months before his death. He was also given two courses of deep x-ray therapy, the last one immediately before his final admission to the hospital.

Summary

1. This paper is a clinical review, including

necropsy findings in thirteen cases of bacterial endocarditis.

2. These cases have been classified according to their presenting symptoms and signs on admission to the hospital.

3. Embolic manifestations concealed in deep structures may dominate the clinical picture of this disease.

4. As a result one may fail to make the correct diagnosis, which comes as a surprise finding at necropsy.

I wish to acknowledge my indebtedness to Dr. John F. Noble and his associates at the Ancker Hospital for the autopsy records of these patients.

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FUNDAMENTAL CONCEPTS OF MEDICAL BIBLIOGRAPHY

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BACK of an understanding of the fundamental principles of medical bibliography among those who are seriously interested in medicine is regrettable. Too often, medical students are unfamiliar with the literature of medicine, to say nothing of methods of compiling a bibliography on a particular subject. The reason for this ignorance among medical students may be referable to the system of pedagogy employed in many medical schools, a system whose application is not limited to medicine but seems almost to be universal. It is the textbook method of reading. Its weaknesses were pointed out by Dr. Robert Watt⁹ of Glasgow more than 125 years ago. He wrote, "The reading of the student is too often confined to systems and con-

pilations which are generally the work of men of no experience or of men writing under the influence of preconceived opinions. To obtain correct views of medicine, it is necessary to have recourse to original authors, to such as write from actual observation who have seen and treated the diseases they describe."

The textbook system of reading makes small allowance for the student's acquaintanceship with the classic descriptions of disease which might be supplied by courses in medical history and bibliography. Medical bibliography, then, offers a fundamental approach to the study of medicine and its teaching should not be neglected.

Many writers and publishers of medical books and articles are seemingly indifferent to the bibliographic aspects of their work. Among these persons the complaint is often heard: "Bibliog-

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raphy never sold a book," or "This article is merely the result of my own experience," or "Bibliography is a nuisance." Yet, if such a writer or such a publisher would consider the fundamental relationship of bibliography to the proper fulfillment of an author's or publisher's work, perhaps the most serious efforts would be devoted to an understanding of it.

Bibliography is the systematic description of that which has been written; it forms the foundation for new writing. By means of bibliography alone is it possible to reconstruct the work in medicine and surgery of our forbears. Without medical bibliography, the splendid indices of medical literature now available would never have been written, and consequently many important contributions would have been lost. Some time ago, Mr. Frank Place^s suggested that, "The science and art of medicine is so dependent upon its literature that reference to authorities is a recognized part of medical composition. The quantity of such printed matter is very great and quotation of sources is as necessary in medical literature as in any other field of human endeavor."

Search of the literature and compilation of a bibliography have always been considered important steps in the solution of a problem in research. A review of the literature may provide the research student with methods and results which might be applied to the presentation or solution of his own problem. Furthermore, a student contemplating a work of investigation is naturally desirous of knowing what has been written that concerns his subject, so that he may have the benefits of a proper background for his study. It is of importance to him to find out whether or not he is duplicating the work of other investigators in his field.

If he uses the works of others in pursuing his own investigation, it should be a tenet of medical ethics that credit be given to the original writer. If it should happen that a worker actually duplicated the work of another, considerable embarrassment might have been spared him had he known that writers before him had prior claim to a discovery that was new to him. A knowledge of bibliography would seem, therefore, to be an indispensable part of a medical writer's equipment.

To the general practitioner, a most practical reason for acquaintanceship with medical bib-

liography is that such an acquaintanceship provides him with a better understanding of new developments in medical science. New developments are published first of all in the medical journals, and later as monographs or books, but unless the physician as a reader is acquainted with medical indices and their use, rather than the contents of such journals themselves, he will not be able to keep up with the discoveries, because the huge avalanche of literature he would have to read if he did not use indices would bury him.

Recently, Dr. William Bulloch,¹ emeritus professor of bacteriology in the University of London, made an enlightening study which showed the enormity of one aspect of the medical bibliographic problem. From the *World List of Scientific Periodicals*, published in 1934 by the Oxford University Press and containing the names of more than 23,000 periodicals published between 1900 and 1933, Dr. Bulloch estimated 5,000 of such periodicals to be medical. If, accepting Dr. Bulloch's figure of 5,000, it is assumed that the average medical publication is a monthly and that it contains about fifty pages per issue, then in the world's periodical medical literature more than 3,000,000 pages are published annually!

Dr. Bulloch investigated in detail the vast output of literature on various medical subjects. In studying the Index-Catalogue of the Surgeon General's Office (the index to the most complete medical library in the world), he found that about 7,000 articles and books had been published on the subject of syphilis alone up to the year 1893. From 1893 to 1912, 14,000 new articles on that subject were published, and from 1913 to 1932, 21,000 articles on the subject were published. In the course of twenty years, 6,780 articles have been published on cardiac disease; 7,000 on pregnancy, including 116 on the occurrence of quadruplets! Between 1913 and 1932, according to Dr. Bulloch's figures, 1,280 papers were published on the excision of tonsils.

Thus, a knowledge of medical bibliography is an entrée to medical literature. In defense of an important aspect of medical bibliography, namely, the medical library, Dr. Archibald Malloch,⁷ librarian of the New York Academy of Medicine, recently said that physicians should be insured against certain risks which they may encounter after graduation, and he enumerated

these risks as follows: (1) the risk of being satisfied with methods of diagnosis and treatment learned in medical school, (2) the risk of being content with what is good instead of striving for what is better, (3) the risk of intellectual laziness which threatens those in an extensive practice, and (4) the risk of becoming rusty.

For insurance against these dangers, Dr. Malloch suggested: (1) the study of disease among private patients as well as among hospitalized patients; (2) discussions of problems at meetings of medical societies; (3) publication of brief papers about important cases; and (4) the perusal of medical journals and books, so that regular reading becomes a habit.

Before becoming involved in a discussion of bibliographic fundamentals, it seems to me that it might be wise to mention that it is not always necessary that an author give evidence of bibliographic search of the literature. As suggested by Dr. C. V. Weller,¹⁰ the factors which influence the use of bibliography in literary endeavors depend upon: (1) the character of the subject; (2) the degree of familiarity with it which the intended readers possess; and (3) the method of approach employed by other authors. If a well known author is preparing a popular article or a book for the laity, it is assumed that he is well versed in the literature of his subject and external bibliographic evidence would not be of value in such works. Similarly, it is obvious that if an author reviews his own technic as a contribution to the medical literature, it is not necessary for him to append a long list of references to his article.

But the more limited the topic, the more precise its application, the more necessary does it become for the author to give evidence of familiarity with the literature of his subject. In fact, even though the author's thesis may give internal evidence of his acquaintanceship with the literature, it may yet be adjudged as inadequate because of its lack of external evidence when read by the inexpert. Thus, it has come about that a criterion invariably applied to the written presentation is whether or not it is accompanied by an adequate bibliography. Dr. J. F. Fulton⁴ even goes so far as to suggest that the character of the bibliographic citations contained in an original contribution provides an almost unfailing index to the scientific merit of a given work and to the care with which the manuscript as a whole

has been prepared. Carelessly made and inadequate references suggest careless and inadequate thinking. On the other hand, if references are accurate and are in good bibliographic form, it can be assumed that the writer is scientific in his thinking. It is, of course, conceivable that an author may have a perfect bibliography and that his written work may be of no value whatever, although such is not often the case.

One very bad result which accompanies the adjudging of papers by their bibliography is the use of coarse, bulky, undigested and unassimilated bibliography to give volume and dignity to articles altogether unworthy of such appendages.

Another and more regrettable corollary of the aforementioned practice is that there is transmitted by many of these authors the perpetuation of bibliographic error. Errors occur because a careless author generally does not go to the original source for either his reading, a procedure which would seem to be essential, or the compilation of his bibliography. Instead, he trusts that the authors from whom he quotes, without verifying their references, have done this. Hence, careless or hasty bibliographic work often results in the perpetuation of error, misquotation, false translation, and above all, incorrect references.

It is important, therefore, that persons seriously interested in medicine pay attention at least to two fundamentals of medical bibliography, namely, (1) the systematic description of medical writings and (2) the verification of references.

Bibliography is defined in Webster's *New International Dictionary* as: (1) "The history or description of books and manuscripts, with notices of the editions, the dates of printing, et cetera," and as (2) "A list of writings relating to a given subject or author; also a list of an author's or printer's works."

In its earlier meaning, now obsolete, the word bibliography (derived from the Greek, *bibliographia*) referred to the writing of books (*biblia*) and consequently, "bibliographer" was the name given to the writer of books; that is, not the author, but the copyist. In accordance with the newer definition, a bibliographer is a person who writes about books, describing their authorship, printing, publication, and other pertinent bibliographic facts. If bibliography is narrowed down to its commonly accepted meaning, it is thought of as "A list of books of a particular

author, printer, or country, or those dealing with any particular theme; the literature of a subject," the quotation being the fourth meaning of "bibliography" in the Oxford New English Dictionary.*

In its broader sense, bibliography is much more than the art of listing the publications on special subjects. First of all, it is the science of the description of books. Proceeding under such a definition of duties, the bibliographer is concerned with the different methods at his disposal for the description of the physical aspects as well as the subject-matter of books. The science of the description of books also concerns itself with the integration of research. To achieve this desirable end, the bibliographer must have a clear understanding of the relationship of the principles of the classification of books to the use of books. His task, in this capacity, is to bring together related works, and thus have sources on the entire medical literature at his finger tips. In making an analysis of the literature, the bibliographer is performing an indispensable service for medicine.

An important part of bibliography is in its historical aspects. There is no more fascinating subject than the history of the care of the book through the ages. From the papyrus roll of the Egyptians and later the Greeks, the parchment book of the medieval period, the printed book of the middle Fifteenth Century to the well printed and bound volume of modern times may be gathered a great story embodying much of the development of scholarship. The introduction of printing by means of movable types has contributed much to modern concepts of culture, but is only one of the many pleasant topics rewarding study in the realm of bibliography.

An important concept of bibliography is one that has recently been advocated by Dr. John F. Fulton,⁵ Sterling professor of physiology in the Yale University School of Medicine. Dr. Fulton describes his point of view in the following terms: "A modern bibliographer must anatomize his books. He dissects them with infinite patience, lifting their epidermis to find what lies beneath; he is concerned with their joints and ligaments, and has great delight in discovering parts which have been artificially replaced; he seeks for errors in the hand of the maker, but he

reviews with charitable amusement all signs of human frailty. Bibliography is indeed an all-absorbing occupation, but its devotee is frequently face to face with those who fail to understand the source of his enjoyment. A mere list of bibliographical idiosyncrasies with mistaken signatures, pagination and gatherings has little appeal to any not a collector of books; . . . a bibliographer . . . has difficulty in justifying his existence if he fails to make himself useful to those not pursuing his specialized field. He must reveal something more than the mechanics of bookmaking. He can endeavor to assess the importance of a book; he may say how the author came to write it, or investigate the influence which it exerted upon his contemporaries."

Dr. Fulton also believes that the fundamental service of bibliography is the indication of the contents of books, and for this reason he assigns due credit to Albrecht von Haller⁶ as the first bibliographer to take a great step toward the humanization of bibliography. So-called humanized bibliography includes, in addition to the description of books: (1) a brief statement concerning the author; (2) an indication of the contents of the book; (3) significance of the book in history; and (4) a list of references indicating where further information may be found.

It may be well, for a moment, briefly to review the fundamentals of the description of medical writings. A bibliographic description of a book or article includes the following features: (1) the author, (2) the title; (3) the publisher; (4) the date of publication; and (5) the pagination. In special cases, other important but subordinate bibliographic points should be included, such as (A) exact collation, (B) the illustrations, (C) the size of the book, and (D) the special features, such as appended bibliography, personal autographs, association notes and the like. But, for practical purposes, points one to five are sufficient.

1. *The author.*—The author's name identifies the writer of the book or article. The surname should be set down, followed by the author's given names. Example: Alvarez, Walter Clement. It is the practice of some institutions and publishing houses to initial the given names.³ Example: Alvarez, W. C. But if the author has only one given name, it is generally written in full.* Example: Amberg, Samuel. If the author

*A new English dictionary on historical principles . . . ed. by J. A. H. Murray. Oxford, The Clarendon Press, 1888. v. 1, pt. 2. "B", p. 846-847.

*This is the practice of The Mayo Clinic Library.

is a woman, it is necessary to write her Christian name in full in order to distinguish her sex. Example: Flock, Eunice V. If two deceased authors have identical names they may be distinguished by appending their dates of birth and death to their names. Example: Adams, John (1735-1826); Adams, John (1819-1892). Europeans sometimes distinguish identical names by adding to each name the place of the author's residence. Example: Hoffman, Julius (Jena); Hoffman, Julius (Würzburg).

2. *The title*.—The title distinguishes the paper or book from other publications by the same author. It should be copied exactly as it appears on the title page. Words in a title are never abbreviated, but insignificant words may be omitted. Three dots indicate an omission. Example: A treatise on headache and neuralgia . . . with an appendix . . . by David Webster . . . ed. 3. It is customary to capitalize the first word and proper names and adjectives in a title. Other words are written in small letters. If the title is in the German language, all nouns should be capitalized.*

3. *The publisher*.—Another aid in identifying a bibliographic reference is its publisher. In referring to a book, it is customary to include the place of publication as well as the name of the publisher. Example: New York, Macmillan. In case the work is the American edition of an English book, the American place of publication is given. Example: New York, Oxford in lieu of London and New York, Oxford.

For a reference to a journal, the name of the journal is given as the publisher. This name may be in abbreviated form and many bibliographers accept the abbreviations as listed in the Quarterly Cumulative Index Medicus.† A more universal list may be found in A World List of Scientific Periodicals . . . London, Oxford, 1934. In case two journals have identical titles, the place of publication may be added. Example: Archives of Surgery (London) and Archives of Surgery (Chicago).

4. *The date*.—The date establishes the worth of a work as to its timeliness. It is, therefore, a most important bibliographic point. To estab-

lish the date of publication of books, it is proper to write down the copyright date, which is found on the verso of the title page. Often the imprint date (found at the bottom of the title page) is in disagreement with the date of copyright because the imprint date refers only to the year of printing of a particular edition. Misinterpretation of the imprint date has led countless people to believe that they were consulting relatively new books, when in reality the information in the books consulted was actually obsolete and practically worthless.

It is, of course, true, as Dr. Paul White¹¹ has shown, that a late date on a book in no way proves that book to be good. A classic or leading textbook of the past is far more valuable than a second rate volume of the present. But, when a physician is led to believe by the imprint date on the title page of a book that he is reading the latest data concerning, for instance, physiology or pathology, it is almost fraudulent to have him thus gulled by a reprinted copy of an old book. An aid to the identification of the date of a book is the number of the edition in which it is issued, in case the book has been issued in more than one edition. This information should be added after the date of publication. In describing a reference to a journal it seems advisable to include the name of the month or the date of issue, in addition to the year. This information is for the convenience of the reader who makes use of unbound journals.

5. *The pagination*.—In order to differentiate a major opus from a pamphlet, the number of pages should be included in the bibliographic description of a book. If a work is published in more than one volume, however, the number of volumes in the set should be substituted for the pagination. In case the author is citing the work of another to prove a point, the exact page number of the medical work in question should be included in either the text itself or a footnote, but it should not be incorporated in a bibliography. If reference is made to a paper published in a journal, the complete pagination should be given in the bibliography. An additional aid to the identification of an article is the inclusion of the volume number of the journal.

Attention to these points greatly facilitates the usefulness of a bibliography, and utility, it would seem, is the primary reason for the compilation. Moreover, the more bibliographic points that are

*It is common practice among librarians not to capitalize the first letter of nouns in a German title. Such a practice not only has no valid basis, but is actually intrinsically wrong, because the genius of the German language, as well as its philological aspects, demands that nouns have capitalized initial letters.

†Included in Morris Fishbein's book (op. cit.).

added, the more the possibility of error is reduced. That is, if the volume number is incorrectly given, chances are that the year or the pagination will serve to help locate a "lost" article.

Examples: Correct reference to a book: Willis, H. S.: Laboratory diagnosis and experimental methods in tuberculosis. Baltimore, Thomas, 1928. 330 p.

Correct reference to a journal article: Wilder, R. M.: Hyperparathyroidism: tumor of the parathyroid gland associated with osteitis fibrosa. *Endocrinology*. 13:231-244 (May) 1930.

Correct reference to a chapter in a book by several authors: Allchin, W. H.: Tuberculosis of the peritoneum. In: Allbutt, T. C., and Rolleston, H. D., eds.: *System of Medicine*. London, Macmillan, 1908, vol. 3, pp. 957-978.

The author in preparing his bibliography for publication should, of course, remember to pattern his references after the custom of the publisher who is to publish his work. That is, a paper submitted to the *Journal of the American Medical Association* should follow the rules of citation of that publication, and a paper submitted to the *American Journal of Physiology* should conform in its bibliography to the form used by that journal. The form employed can be easily determined by consulting the particular journal. Another point might be emphasized: The author should be consistent in citing references. He should learn to make them correctly, adhering to this procedure until accuracy and care become habitual, so that reference work eventually will not be any trouble to him, to his readers or to his publishers.

After the author has compiled his bibliography and has prepared his article for publication, his task is still incomplete until he has verified his references. Verification would be a waste of time if all writers were 100 per cent accurate in citing their sources. But the possibilities for error in bibliographic work are endless. How often are mistakes made in copying the volume number, the page number, the year, the author's name, and even the title of a publication!

There is much in the literature on the subject of the perpetuation of errors in medical bibliography. A recent article by Dr. Clifford Dobell² traces the birth and death of Dr. O. Uplavici (1887-1938), who turned out to be a wholly fictitious personage. According to Dr. Dobell, "Dr.

Uplavici, though a pure Czech, had a Greek father and a German mother. He was born in 1887, published his only paper in the same year, obtained his doctor's degree later in the United States, and now—after a checkered career in many countries—breathes his last . . ." After much search in the literature, Dr. Dobell found Dr. Jaroslav Hlava (1885-1924), a distinguished Czech physician, to be the author of an article on amebic dysentery which for fifty years had been falsely attributed to a Dr. Uplavici. The error was perpetuated because Dr. Hlava's original paper had been published in *Časopis lékařů českých* (Journal of the Czech Physicians) of Prague in v. 26, No. 5, for Jan. 29, 1887. Hlava's paper was written wholly in the Czech language and was entitled, "O úplavici Předběžné sdělení" (On dysentery: preliminary communication). Because no translation of the paper in any language had been published, the original is still known to most workers by a brief abstract of it which was published in German in the *Centralblatt für Bacteriologie und Parasitenkunde*, v. 1, p. 537; 1887. But by some extraordinary mistake, the author's name was entirely omitted from the German abstract, and the title of his paper, "O úplavici" was given as Uplavici, O., so that it appeared to be the author's name.

In this strange manner, a new worker, O. Uplavici of Prague, made his first appearance in the literature on amebic dysentery. This particular confusion of title with name led to much confusion in the literature, and Hlava's name has been incorrectly referred to as O. Hlava (instead of J. Hlava) and also as Hlava, Uplavici, and O. Uplavici. Dr. Dobell adds that in a recent paper both Hlava and Uplavici were mentioned as two different workers who studied dysentery among cats in the early days.

Many other examples of the perpetuation of error in medical bibliography might be given, but the aforementioned instance should suffice to make the reader realize the necessity for verification of all references. It is most important that an author take the trouble to verify a statement he is quoting from another, for the writer from whom he quotes may himself be quoting another author inaccurately. If the original source is unobtainable, mention should be made of the writer from whom it was obtained. The author should not only verify the bibliography in his manuscript, but he should also verify it in the

printed proofs of his paper, for more errors may have crept in since his original manuscript left his hands.

To do a perfect job of verification, the original books and articles should be compared with the bibliography and all bibliographic points should be proved. Verification should not be done from the indices to the medical literature except on those rare occasions when an author has read the original reference elsewhere, not in his own local library. If he has used a secondary source, then mere literary honesty demands that he quote that source.

To borrow a conclusion from Mr. Frank Place because it cannot be stated any better: "Take no reference for granted. Verify the reference that your best friend gives you. Verify the reference that your revered chief gives you. Verify, most of all, the reference that you yourself found and

jotted down. To err is human, to verify is necessary."

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CYSTOGRAPHY IN THE STUDY OF DIFFICULTIES FOLLOWING PROSTATIC SURGERY*

THEODORE H. SWEETSER, M.D.

Minneapolis, Minnesota

I HAVE previously¹ discussed the principle that the preoperative diagnosis of vesical neck obstruction should be made as completely and accurately as possible with the least possible disturbance to the patient. I maintained that cystography has much value in such a program, a concept well recognized in the literature but apparently not widely followed in practice. If such a principle applies to the primary study of vesical neck obstruction, how much more should it be applicable to the study of difficulties following operations on the prostate and vesical neck. Such a study demands not only thoroughness and a clear demonstration of the condition present, but also tact, diplomacy and usually some regard for the expense of the proceedings.

A fairly extensive literature regarding cystography and urethrocystography has grown up in the last twenty years, but this valuable means of diagnostic study seems still to be neglected. Several prominent urologists have told me that

they do not use cystography nearly as much as they should, and one or two recently have asked what I could determine from cystography that I could not determine from cystoscopy, especially with the retrospective telescope.

Cystoscopy, including inspection of the bladder neck with the right angle and retrospective lenses and inspection of the prostatic urethra by direct and oblique vision, has long been the standard method of study. But I think you and the men with personal experience will agree that cystoscopy should be the last rather than the first preliminary examination, especially in old and feeble men. Cystoscopy is sometimes technically difficult or impossible in these patients previously operated upon because of distortion or stricture of the urethra, and it sometimes fails to give complete or accurate information because of bizarre irregularities.

Urethrocystography has been used with skill and excellent results in certain clinics in this country and abroad. Without question it can be made to furnish a more complete picture than cystography but requires more skill and

*Presented before the meeting of the Western Surgical Association at Omaha, Nebraska, December 2, 1938.

experience in production and interpretation, and therefore is not apt to become as practical for the man of less than large urologic practice.

Excretory urography may be made to give

more clearly than cystoscopy, especially when interpreted in conjunction with rectal examinations, and it gives a graphic permanent record of the findings for later comparisons. Although it

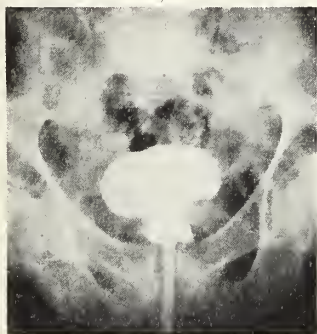


Fig. 1. This patient, about eight months after suprapubic prostatectomy, complained of frequent urination without any residual urine after voiding. The cystogram shows a small rigid bladder and a rigid irregular non-collapsing prostatic space.



Fig. 2. This patient had vesical and prostatic calculi and hypertrophy of prostate when suprapubic prostatectomy was performed in 1923; he has had many stones removed by cystoscopic means since. One can see the shadows of calculi in the prostatic space, and the thin layer of tissue between them and the bladder cavity.

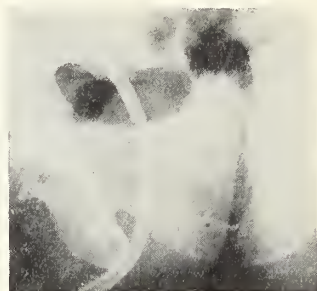


Fig. 3. This patient had a suprapubic prostatectomy sixteen years ago. This recent cystogram showed a typical benign prostatic hypertrophy, and 40 grams of tissue were removed by suprapubic prostatectomy.

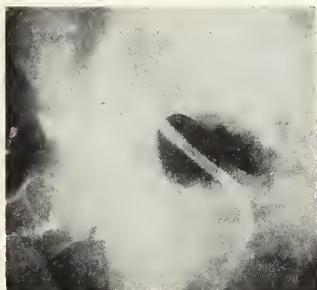


Fig. 4. This patient had a suprapubic prostatectomy seventeen and one-half years ago and a transurethral prostatic resection three and one-half years ago, with removal of 20 to 25 grams of tissue. At the time of this cystogram the residual urine still measured 375 c.c. Further resection of 27 grams gave a completely satisfactory result. The irregular projections into the bladder base indicate a combination of adenomas and scar tissue.



Fig. 5. This patient, at the time of cystography several months after transurethral resection, was having difficulty in voiding; he later underwent another operation. There is a slightly convex elevation of the bladder base around the urethra with the normal curve of the bladder base farther to the side.



Fig. 6. This patient underwent transurethral prostatic resection, after which he emptied his bladder completely but had persistently frequent and difficult urination. The cystogram showed a large, though faintly seen, mass projecting into the bladder anterior to the catheter; the trickle of fluid down the urethra far anterior to the catheter further demonstrates the size of the lateral lobe enlargement. By suprapubic enucleation I removed a large mass of tissue consisting of the anterior part of one lateral lobe of the prostate.

good cystograms if the renal excretion is satisfactory, but it is not always definite and is relatively expensive.

Cystography is a simpler procedure than urethrocytography and is less disturbing to the patient than cystoscopy. Excellent cystograms have been made by several of my friends in general practice. Cystography may show the status of the bladder and bladder outlet even

may not be accepted as advisable for routine follow-up after a primary operation, especially when there are no signs of trouble, still cystography is a simple and safe means of checking the result.

Certain errors in technic and interpretation are possible but such may be said of any method of examination. I have several times wished that I had made a preliminary cystogram,

especially the oblique view, before undertaking cystoscopy. This has been true in cases studied after previous operative treatment even more than in cases with no such previous history.

amount of tissue suprapubically or by transurethral resection (Fig. 3).

After transurethral prostatic resection, complete or partial failure to empty the bladder is

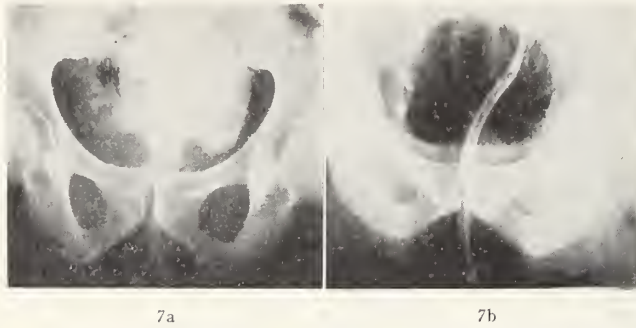


Fig. 7. This patient had two transurethral prostatic resections about one week apart and was having a rather stormy convalescence two weeks later when the cystogram (a) was made. It showed incomplete filling of one side of the bladder and also the remaining intravesical prostatic tissue and the fair channel where tissue was resected. Eight months later the cystogram (b) showed complete rounding out of the bladder outline but still some persistent prostatic shadow. The patient is now so well and so well satisfied with his present condition that he has not availed himself of my offer for another cystogram.

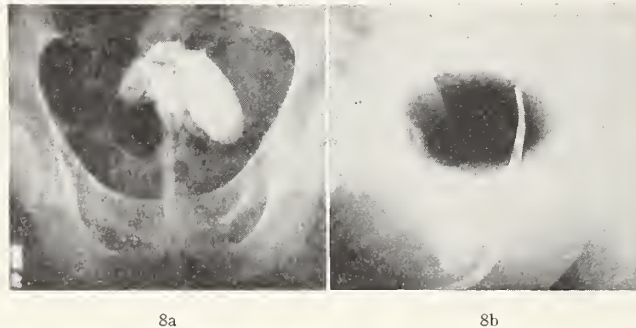


Fig. 8. This patient had a cystotomy followed by transurethral prostatic resection elsewhere in April, 1935. In August, 1937, he was again having trouble. Flat radiograph of the pelvis (a) showed calculi of such size and number that I removed them and some remaining prostatic tissue suprapubically. He has been very well since; a cystogram (b) in November, 1938, showed a satisfactory bladder outlet and no calculi.

Prostatic obstruction being removable by transurethral resection or by enucleation suprapubically or perineally, difficulties may follow any of the methods. My experience with the perineal operation is too limited to mention.

After suprapubic prostatectomy, continuing infection occasionally results in persistence of a large, rigid, infected prostatic space and an irritable bladder of small capacity (Fig. 1). Sometimes this rigid space contains calculi and may be separated from the bladder partially by a shelf of scar tissue and internal sphincter muscle (Fig. 2). Several times I have seen recurrence of obstruction fifteen or twenty years after prostatectomy, and have removed a fairly large

due to incomplete removal of prostatic tissue projecting into the bladder or into the urethra (Figs. 4, 5). If remaining tissue is situated anteriorly in the lateral lobes or in the anterior lobe, the difficulty may be recurring hematuria or dysuria and bladder irritability without failure to empty the bladder (Fig. 6). In one case during a stormy convalescence we found evidence of damage or inflammatory reaction of the bladder wall in addition to incomplete removal of the prostate (Fig. 7). Occasionally the hematuria and irritability are due to calculi, associated with some remains of the prostatic obstruction (Fig. 8a). After one has given appropriate treatment of the patient's difficulty,

cystography (Fig. 8b) is a simple and safe means of rechecking the adequacy of the treatment. Occasionally the source of difficulty some time after a prostatic resection is some other

caution, it should be available at least as a preliminary means of study to those not equipped to do cystoscopy. Cystography may be done as a step in excretion urography, or separately by

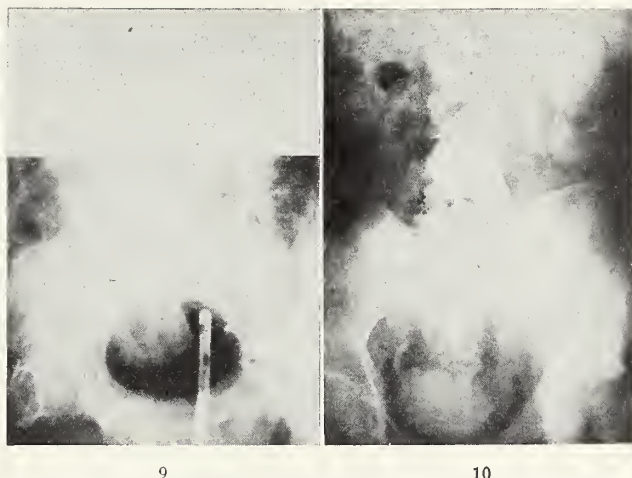


Fig. 9. This patient underwent suprapubic cystotomy and cauterization of a bladder carcinoma elsewhere in June, 1937. Prostatic resection was done in November, 1937, because of a persistent suprapubic sinus. This cystogram of April, 1938, shows no vesical neck obstruction and no trouble in the scar of the previous cauterization (to right of catheter tip on radiograph). Note large tumor projecting into the bladder from its vault (to left of catheter tip on radiograph).

Fig. 10. This patient had prostatic resection in California two years ago. Two months ago, also elsewhere, he had two resections (18 grams and 7 grams). Urography shows no vesical neck obstruction, but evidence of left hydronephrosis and a very marked osteoblastic involvement of the left side of the pelvis and lumbar spine evidently originating from carcinoma of the prostate.

lesion, such as carcinoma of the bladder (Fig. 9) or metastases from carcinoma of the prostate (Fig. 10).

In conclusion, I wish to offer cystography as a simple and safe means of investigation of difficulties following prostatic surgery. With

catheter injection of air or radiopaque fluid. In my opinion it should usually be used in such cases before deciding on cystoscopy.

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BALANCING THE HEALTH BUDGET

Testimony before the Sub-committee of the Committee on Education and Labor of the United States Senate, by Dr. Thomas Parran, Surgeon General of the United States Public Health Service: "In connection with balancing the budget, Mr. Chairman, I hope that this Congress will give more attention to balancing our health budget. It is cheaper to keep a woman from dying in childbirth than to take care of the orphans in an orphan asylum or to give aid to the dependent children. It is cheaper to aid in building tuberculosis sanatoria than it is to pay for the deaths from tuberculosis and the widows and children who are left. The State Health Officer of Tennessee estimates that it costs on the average of \$150 to bury a person in Tennessee, and on that basis it is costing that State more to bury people dying from tuberculosis than expense for its entire health program including tuberculosis and all the other diseases."

CASE REPORT

PERFORATION OF MECKEL'S DIVERTICULUM BY FISH BONE*

Report of Case

R. V. WILLIAMS, M.D.

Rushford, Minnesota

MECKEL'S diverticulum was first described by Johann F. Meckel in 1809 and 1812 and according to Gray's Anatomy it is described as follows:

"Meckel's diverticulum consists of a pouch which projects from the lower part of the ileum in about 2 per cent of subjects. Its average position is about one meter above the ileocolic valve, and its average length about five centimeters. Its calibre is generally similar to that of the ileum and its blind extremity may be free or may be connected with the abdominal wall or with some other portion of the intestine by a fibrous band. It represents the remains of the proximal part of the vitelline duct, the duct of communication between the yolk sac and the primitive digestive tube in early fetal life."

Roy Shannon in the *Archives of Pediatrics*, December, 1928, said:

"According to Fitz, in the newborn it lies about 12 inches above the ileocecal valve, while in the adult this is increased to about three feet. The diverticulum may be long or it may be short, or may or may not have a separate mesentery; or may be contained within the mesentery of the small bowel. It may be fixed at its distal extremity to the umbilicus or to any structure within the abdominal cavity. It is often conical in shape with the base large, even approaching in size the diameter of the small bowel at this point. According to Christopher, it usually has the same coats as the intestine, the mucous coat containing Lieberkuhn's glands and Peyer's patches. This same writer quotes Aschoff as saying that it may contain gastric glands, ciliated epithelium and even pancreatic anlage. A certain number of Meckel's diverticula are associated with deformity of the umbilicus, and marked retraction of the naval therefore always brings to mind this possibility."

The incidence of Meckel's diverticulum, according to the literature on this subject, has changed considerably in the past forty years. The earlier authors quoted the incidence as 1 per cent, while the literature written the last five years, which has been quite extensive, quotes the incidence as 2 and 3 per cent. This change, I think, can be fairly stated as due to the fact that the surgeon has become more and more diverticulum minded. Meckel's diverticulum is apparently found more often in males than in females, the ratio being about 2:1.

Case History

The patient, male, sixty-two years old, was born in Fillmore County, Minnesota, of Norwegian parents and for the last twenty-six years has been a rural mail carrier.

*Read before the meeting of the Southern Minnesota Medical Association, New Ulm, Minnesota, September 18, 1939.

Previous history.—At the age of fourteen years, or in 1891, the patient was taken rather suddenly with severe "abdominal cramps" as he remembers the symptoms and also with vomiting. The nearest doctor was sent for, but he was twelve miles away and twelve hours elapsed before he could get there. By this time the symptoms were pretty well over. He was left with considerable soreness over the right side of the lower part of the abdomen which he remembers very well to this day. At the age of nineteen years he had pleuropneumonia which was followed by an empyema. He was operated on at a La Crosse, Wisconsin, hospital. He was in the hospital for five weeks and recovered fully. Since this date, 1896, he never suffered any illness of importance, but in his own language had had a day or two with a severe "bellyache" which came on at intervals of from two to five or six years without any particular reason and always centered in the right lower quadrant. He never passed any blood to his knowledge but sometimes he would have some bowel disturbance, and there was always some tenderness which lasted for a day or longer.

Present history.—About three days previous to April 28, the date I was called, the patient began having an attack similar to those described previously and differing only in that there was no let-up and every day the pain was just a little bit worse. He kept right on making his usual rural mail route trips and in the afternoons would busy himself preparing an acre of tobacco ground. During the afternoon of the third day of this attack he pitched fertilizer. About 5 o'clock he got some very sharp stinging pains and reached home with considerable difficulty. He was nauseated but did not vomit. I was called about 7 o'clock in the evening.

Examination.—The patient was a large robust man, 5 feet 11 inches tall, and his weight was 190 pounds, which had been his usual weight for many years. His temperature was 101.4° F. and the pulse 96. Heart and lungs were normal. The abdomen was slightly distended. There was a great deal of tenderness over the entire abdomen and a marked amount of rigidity. This tenderness and rigidity were much more evident over the right lower quadrant. Every few minutes he would say, "There comes another of those terrible sharp pains," and the abdomen would become very rigid. The urine was negative and the blood count showed over 16,000 leukocytes.

An extensive peritonitis was quite evident, probably due to a ruptured appendix, and an immediate operation was advised. The patient was taken to a La Crosse, Wisconsin, hospital and was operated on about 10:30 p. m.

Operation.—A split muscle opening was made and a large amount of dark watery fluid presented itself first. The appendix was easily found and showed no signs of either present or former inflammation. Upon investigation it was found that the seat of the trouble was toward the median line and could not be reached

(Continued on Page 66)

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN HENNEPIN COUNTY

BY A. S. HAMILTON, M.D.

(Continued from December issue)

The directories for 1867 give the list of physicians in Minneapolis and Saint Anthony as follows:

Minneapolis

Ames, A. E. and A. A.
Butler, L.
Bowen, J. S.
Elliot, A. F.
Elliot, J. S.
Evans, O. J.
Hatch, P. L.
Hill, N. B., and Lindley, A. H.

Huntington, T. R.
Leonard, W. H.
Linn, J. J.
Ortman, A.
Shippen, Edward
Snell, E.
Weisel, W.
Wheat, J. N.

Saint Anthony

Dibb, Wm. D.
Jewell, Geo. P.
Jewell, L. P.
Johnson, A. E.
McKay, John
Stockton, E. A.
Stockton, E. H.
Rankin, S. F.

Daily Tribune, November 28, 1868:

"At a meeting of the Union Medical Society held last evening at the office of Drs. Hill and Lindley the following named officers were chosen for the year: President, A. E. Ames; Secretary, N. B. Hill; Librarian, A. H. Lindley. The Society is at present composed of the following named members: Drs. A. E. Ames, G. H. Keith, W. D. Dibb, A. Ortman, N. B. Hill, O. J. Evans, W. F. Hutchinson, J. J. Linn, C. A. McCollom, H. A. DuBois, C. G. Goodrich, H. H. Kimball, C. J. DuBois. The next regular meeting will be held on the first Saturday in December at the office of Dr. W. F. Hutchinson."

Some time in the course of this year, during Dr. Ames' absence in California, Dr. N. B. Hill was made president of the society, but I could find no record of the occasion in the daily papers.

Daily Tribune, Dec. 4, 1868:

"At a meeting of the Union Medical Society last Tuesday it was unanimously agreed that in future all bills should be presented for payment within sixty days after the termination of treatment of a case. Mr. J. C. Hall has been chosen collector for the Society."

Daily Tribune, March 20, 1869:

"The regular meeting of the Union Medical Society will be held this evening at the office of Dr. W. F. Hutchinson in Centre Block."

No account of the April meeting has been found.

Daily Tribune, May 16, 1869:

"At the annual meeting of the Hennepin County Medical Society the following officers were chosen for the following year: President, A. E. Ames; Vice President, N. B. Hill; Secretary, W. F. Hutchinson; Librarian, O. J. Evans. The following committees were appointed: Ethics—Goodrich, Linn, Ortman. Publications—Lindley, McCollom, Kimball. A special committee was also appointed to assist the Health Officer in the discharge of his duties."

Evidently the change in name of the society occurred between March 20, 1869 and May 16, 1869.

Daily Tribune, June 12, 1869:

"A special meeting of Hennepin County Medical Society to be held this evening at the office of Dr. Hutchinson. All members are requested to be present. W. F. Hutchinson, Secretary."

Daily Tribune, Sept. 18, 1869:

"In September, 1869, Minneapolis was visited by Sir Henry Holland, the eminent English physician [eminent he certainly was if his experience was as extensive as is indicated in the notes that follow in the *Tribune*]. He was consulted in Napoleon's last illness, attended Mrs. Thrale (Dr. Johnson's friend), was the physician and friend of the poets, Campbell, Moore and Rogers, as well as of Madame D'Arblay, Joanna Baille, Lord Brougham, Sydney Smith, Macaulay and others. He was present at the deathbed of Channing and knew Madame de Staël, Talleyrand, Byron and Sir Philip Francis."

Daily Tribune, June 8, 1870:

"Hennepin County Medical Society held its annual meeting yesterday. It was chiefly a business meeting. A new constitution and by-laws was adopted, modeled after that of the State Society. The election of officers for the ensuing year resulted as follows: President, A. E. Ames; Vice President, N. B. Hill; Secretary, Geo. H. Keith; Treasurer, O. J. Evans. The president appointed the following standing committees: Ethics—C. G. Goodrich, A. H. Lindley, J. J. Linn. Membership—M. D. Stoneman, W. G. Hutchinson, H. H. Kimball. Dr. Kimball was appointed to prepare and read an essay at the next regular meeting."

This is the first reference I have found in the papers to any program, though, according to Dr. Phillips, it was by no means the first paper.

Daily Tribune, Aug. 2, 1870 (Tuesday):

"Regular meeting this afternoon at two o'clock at the office of Drs. Hill and Lindley."

It was evidently at this meeting that Dr. Ames presented the paper referred to at the beginning of this chapter. According to his statement the society had enrolled up to that date thirty-nine members, of whom four had died and seventeen had moved away, leaving eighteen members at that time in the society. The four who died were the following:

Dr. C. W. LeBoutillier, who was a graduate of the University of Paris, came to St. Anthony in 1854, and died in 1863. He is referred to elsewhere in this article.

Dr. E. Denny Olds, who was made a member of the Society on December 17, 1855, later left Minneapolis, and went to Mexico, where he was assassinated in 1858.

Dr. F. C. Lowenburg, who was a graduate of Leipsig University, came to St. Anthony in 1855, and died in 1864.

Dr. J. White, who was a graduate of the Medical College of Brunswick, Maine, came to St. Anthony in 1853, and died in 1856 at thirty-three years of age.

The list of those who had moved away is as follows, and is specially interesting as showing how widely distributed these former members of the society had already become in 1870:

Dr. John H. Murphy came to Saint Anthony in 1849. After the close of the war he took up his residence in Saint Paul, where he still resided.

Dr. J. W. Wheelock had moved to and then resided in Clearwater, Minnesota.

Dr. Charles L. Anderson came to the city in 1853, and in 1861 moved to Carson City, Nevada, where he remained two or three years. In 1870 he was residing in Santa Cruz, California.

Dr. J. Wilkin had remained in Minneapolis but a short time, and his address in 1870 was unknown.

Dr. W. H. Gould lived for many years in Saint Anthony and practiced dentistry. In 1870 he resided in Boston, Massachusetts.

Dr. M. R. Greely came to Minneapolis in 1857, and was at this time residing in South Weymouth, Massachusetts. During the Civil War he served as assistant surgeon to the 3rd Minnesota Regiment of Infantry.

Dr. D. C. Ayres remained about two years. His address in 1870 was not given.

Dr. Henry Gilbert remained in Minneapolis about one year, and in 1870 was living in Brooklyn, N. Y.

Dr. R. H. Ward was in Minneapolis but a short time, and devoted his attention to microscopy. He was then residing in Troy, New York.

Dr. Albert A. Ames was a graduate of Rush Medical College and practiced medicine in the city about three years, and was later surgeon in the Seventh Regiment. He left for California in 1868, and in 1870 was living in Portland and was editor of the *Portland Daily Bulletin*.

Dr. A. Judson Grey was in the cities one year, and in 1870 was residing in Providence, R. I.

Dr. J. J. Bowen was living at La Grange, Indiana.

Dr. H. A. DuBois was an active member of the society about one year. In 1870 he was practicing in San Rafael, California.

Dr. C. J. DuBois was a member of the society for a short time and in 1870 was living in the Island of Capri.

Dr. John H. Churchill came to Saint Anthony for his health, and later removed to New York City, where he resided in 1870.

Dr. Edward A. Barden remained for a time in Minneapolis, but moved later to Alexandria, where he resided in 1870.

Dr. James A. Baldwin remained in the cities but a short time, and then moved to Kansas City, where he was practicing in 1870.

Toward the conclusion of his article, Dr. Ames writes as follows, evidently referring to himself:

"One is here today who saw this locality in its infancy; then it was listening to the voice of praise of the great organ of nature. That member took an active part in the organization of this Society, and has given to its aid and support since it was formed. He will soon go out and you will write up his record."

The above appears a very modest statement to be made by one who had founded the society, and had served it so long and so prominently. At some time previous to the death of Dr. Ames, at the request of his children, he wrote his biography in a little booklet, which afterwards was in the keeping of Mrs. Ames.

In looking through this book it is notable that Dr. Ames refers infrequently and very briefly to his medical experiences, but apparently took great pride in his relation to the Masonic Brotherhood, to the founding of the Horticultural Society, and to the political offices which he had held. Probably he assumed that his very great interest in medical matters would be taken for granted.

He was the first president of the permanently organized Old Settlers organization (announced in *State Atlas* of January 16, 1867), was foreman of the Grand Jury in the first court held by Judge Meeker after the organization of Hennepin County, and was president of the Minneapolis Farmers Club, and of the Hennepin County Bible Society. In November, 1851, Dr. Ames called the Masons together and subsequently established Cataract Lodge, and was its Grand Master on February 3, 1853, and was also subsequently Grand Master of the Grand Lodge of Minnesota, and was one of the ruling elders of the First Presbyterian Church organized here.

The *Tribune Directory* of Minneapolis and Saint Anthony gives the following list of physicians, 1871-1872:

<i>Allopathic</i>	<i>Eclectic</i>
Ames, A. E.	Blecken, Charles H.
Cummings, Ralph W.	Elliot, A. F.
Evans, O. J.	Elliot, J. S.
Goodrich, C. G.	Haynes, S. C.
Hammond, J. H.	Kimball, B. W.
Hill, N. B., and Lindley, A. H.	Loar, Jacob
Hutchinson, W. F.	Stanton, W. B.
Johnson, Geo. B.	Walcot, A. P.
Kimball, H. H.	Talbot, A. V.
Linn, J. J.	
McLain, J. L.	<i>Homeopathic</i>
Phillips, E.	Goodwin, D. M.
Rouse & Johnson	Hatch, P. L.
Teengs, W. J.	Humphreys, Otis M.
Chute, S. H.	Huntington, T. R.
Johnson, A. E.	Leonard, W. H.
McBain, A. E.	Penneman, W. A.
Ortman, A.	
Rouse, W. H.	<i>Miscellaneous</i>
Stockton, E. H.	Etzler, C. H.
Townsend, G. F.	Hale, Miss Mary
	Reinhold, F. K.
	Smith, James A.

The *Tribune Directory* for 1873-1874 says:

"Hennepin County Medical Society was organized in 1855 and is in an interesting and satisfactory condition. Its president is the very oldest physician and surgeon now practicing in Hennepin County and a gentleman well worthy of the honor of the position. Meetings are held every two weeks at the office of one of the members. Officers are: A. E. Ames, President; N. B. Hill, Vice President; Geo. B. Johnston, Treasurer; O. J. Evans, Secretary."

The *Daily Tribune*, Friday, June 6, 1874:

"The Hennepin County Medical Society met at Dr. Ames' office and after reading the minutes of the last meeting elected Drs. Salisbury and Bedford as members of the Society, after which the election of officers took place. Dr. A. E. Ames was unanimously elected president; Dr. Charles Simpson, vice president. Dr. C. C. Clark, secretary; and Dr. Bedford, treasurer. Committee on Ethics—Goodrich, Lindley, Johnson. Membership—Linn, Rogers, Phillips. Printing—Smith, Salisbury and Ortman."

Campbell and Davison's *Directory* gives a list of officers for the year differing decidedly from this, and being practically identical with those of the year before. Here is the list: A. E. Ames, president; N. B. Hill, vice president; O. J. Evans, secretary.

Dr. A. E. Ames died on September 23 of this year (1874) and the following

history of his life is taken partly from a contemporary account in the *Tribune* and partly from *Minnesota Biographies*:

Dr. A. E. Ames was born in Colchester, Vermont, in 1814. His parents were poor and as a child he was so sickly that he was not expected to grow up. Later the family moved to Orwell, Ohio, and in the common schools of these two places he acquired his education. While teaching in 1834 he met Miss Martha Pratt, whom he married in 1836, and a month after his marriage he went to Chicago, then a town of 3,000, mostly half-breeds. From there he followed the Indian trail west to a place later called Amesville, now Garden Prairie. Here he took a claim of 160 acres, and built a log house. In April, 1837, he returned to Chicago and worked for \$52 a month at brick-making. On November 25, 1838, he walked to Vandalia, then the capital of Illinois, and was there introduced to Alex. Field, Secretary of State, by Stephen A. Douglas, and was appointed Deputy Secretary of State and also Private Secretary to Governor Carlin; and in these positions he earned \$6 a day. In 1839 he was again Deputy Secretary of State, Secretary to the Governor, and chief of the staff of clerks, earning thus \$10 a day.

In 1840 he began to attend medical lectures at Rush, and in 1841 he studied with Dr. Maloney of Belvidere. At this time he was in very poor health. He was elected a member of the House of Representatives of Illinois in 1842. In March, 1843, he was made postmaster at Belvidere. In July, 1844, he resigned and moved to Roscoe, Illinois, where he began the practice of medicine, and was made postmaster December 16. In February, 1845, he graduated from Rush. In 1849 he was elected State Senator, and made paymaster general on the Governor's staff. He started three Masonic lodges in Rockton, Roscoe, and Rockford, Illinois. In October, 1851, he left Roscoe for Saint Anthony, going by wagon from Roscoe to Galena, thence by the famous Dr. Franklin No. 1 to Saint Paul. He secured a permit to make a claim on the Reserve, now Minneapolis, and in November, 1851, built his claim cabin on the lot now occupied by the Court House. Immediately following his arrival he entered into a partnership with Dr. Murphy of Saint Anthony. In the spring of 1852 he brought his family from Illinois. The same year he was made contract surgeon at Fort Snelling and in October was elected to the territorial legislature. October 10, 1854, he was made probate judge. In January, 1856, he was appointed postmaster. In 1857 he was chairman of the committee on school lands and university, and in 1860 was a member of the State Normal school board, serving during the organization of that system. In 1861-1862 he delivered a course of lectures before the high school of Minneapolis on anatomy and hygiene, being thus, doubtless, the first to give public instruction in Minnesota on a medical subject. In 1852 he went east to visit the hospitals. In 1868 he again went east, and then to California, where he had some idea of remaining, offering his home and property here for sale, but returned. "He was always actively interested in all educational matters. In fact, he was never idle and scarcely ever allowed to remain in private life. He was a member and almost always a leader in the medical society." This is almost the only reference in the above accounts to his medical life, though, curiously enough, he was probably president of Hennepin County Medical Society practically continuously from its inception in 1855 to his death in 1874, almost twenty years.

Dr. Ames was a member of the American Medical Association, had been president of the Alumni of Rush Medical College, and was much devoted to

his profession, to which he had given many years of hard labor. In a memorial notice given in the Transactions of the Minnesota State Medical Society for 1875, Dr. O. J. Evans says of him: "The most prominent probably of Dr. Ames' characteristics was that most commendable of all the graces—charity. During an acquaintance of nine years, I think I never heard him speak an ill word of any person."

On February 5, 1875, occurred the death of Dr. Nathan B. Hill, who, though not one of the founders of the Hennepin County Medical Society, was one of its earliest and most influential members. Dr. Hill was born in Randolph County, North Carolina, on May 13, 1817. After graduating from Haverford College, near Philadelphia, he entered mercantile life with his father, but later decided to enter medicine, and attended Jefferson Medical College during the session of 1842-1843. In May, 1845, he married, and in the winter of 1847-1848 moved to Cincinnati, where he attended lectures at Ohio Medical College and graduated in 1848, after which he returned to North Carolina and practiced until 1861. He was a strong anti-slavery man and was interested in the underground route for the freeing of slaves, to the great detriment of his practice and danger of his life. In May, 1861, in company with Dr. Lindley, he came overland to Indiana, crossing the Ohio River at Louisville, and in September came to Minneapolis, where he and Dr. Lindley formed a partnership which continued to the death of Dr. Hill. At the time of his death he was president of the State Medical Society, the annual meeting of which he had called to order but a few hours before his death. His address was read by Dr. Hewitt. Dr. Hill was a devout member of the Society of Friends, and was a man of fine susceptibilities, generous impulses, and of the highest integrity, and, with his natural ability, his superior education and kindly ways, he became a very prominent physician in this community.

There are many others among the older physicians of whom special mention might be made did the limits of this paper permit, but it will not be considered an invidious distinction, I think, if I refer particularly to the following:

Dr. C. W. LeBoutillier was a native of the island of Jersey, emigrated to this country about the year 1850 and settled in Iowa. In 1853 he came to Saint Anthony and commenced the practice of medicine, and soon became known as an honorable, skillful and successful physician. On April 29, 1861, he was commissioned as assistant surgeon in the 1st Minnesota Infantry, and the *State Atlas* of July 24, 1861, carried the news of his death at the battle of Bull Run, and gave an account of his life and work; but a telegram of August 16 announced that he was alive and well, had elected to remain with his wounded and was a prisoner in Richmond. The ten federal surgeons in Richmond were divided into two groups and Dr. LeBoutillier was placed in charge of one group. In this position his assiduous care and kindness to the wounded won grateful praise from those to whom he ministered. The *Pioneer* of September 17, 1861, contained a letter from him, dated August 15, and described some of his surgical experiences among the soldiers. Paroled, he returned to Minnesota, where he remained with his family until the time of the Indian outbreak, when he became surgeon of the Ninth Regiment, October 10, 1862, and went to Saint Peter, where he remained on duty until his death April 3, 1863, aged about thirty-seven. He was buried with military honors in Saint Anthony. Dr. LeBoutillier left the record of an honorable and successful physician, a good citizen and a brave soldier. He seems to have been held in particularly high esteem by his fellow practitioners.

Dr. A. Ortman located in Saint Anthony in 1857, was later active as a city and county physician and was one of the oldest members of the State Medical Society, of which he was made an honorary member without dues. He was a very excellent man, notable for his high ethical standards and kindly disposition. Owing to the development of cataracts, he became blind several years before his death.

Dr. A. H. Lindley was born in North Carolina in 1821. He came to Minneapolis in 1861 and began practice with his brother-in-law, Dr. N. B. Hill. He was a well educated, reliable, conscientious and successful physician, prominent in the sanitary interests of the city, and its first health officer. As a result of judicious investments he became very wealthy, and died in Minneapolis at the advanced age of nearly eighty-four years.

Levi Butler came to Minnesota in 1855 from Indiana. He was married and had practiced ten years before his arrival. He had a moderate fortune and became interested in educational, moral and temperance activities. In 1861 he recruited a company of volunteers, and was made captain and afterwards surgeon of the Third Regiment of Minnesota Infantry, of which his company was a part. He was commissioned November 11, 1861, and went south. When his regiment surrendered at Murfreesboro he returned to assist in the suppression of the Indian outbreak. He later rejoined the service and was in campaigns in Kentucky and Louisiana. He resigned and came home in September, 1863. Dr. Butler was one of the large number of tuberculosis patients who came to Minnesota in search of health, and it was on account of a return to his old trouble and a condition of protracted ill health that he was discharged in 1863. In the following year he was appointed by the governor to visit southern camps and hospitals to improve sanitary conditions and relieve the suffering of sick Minnesota volunteers. At the return of peace he did not engage in practice but went into the lumber business with T. B. Walker and H. W. Mills, under the name of Butler, Mills and Walker. He died in 1868.

Dr. William H. Leonard was born in Mansfield, Connecticut, December 2, 1825, and graduated from Yale Medical School in 1853, and settled in Minneapolis in 1855. The initial meeting of the Hahnemann Medical Society was held in his office and he was the first president of that organization. He was successively assistant surgeon and surgeon to the Fifth Minnesota Regiment of Infantry, and served from November 22, 1862, to September 6, 1865, and was discharged with his regiment. He died in the city of Minneapolis, April 9, 1907.

Dr. A. A. Ames was graduated from Rush Medical College in February, 1862, and shortly after began practice in Minneapolis. In August, 1862, he helped to raise Company B, Ninth Minnesota Infantry, himself and brother enlisting. The same month he was commissioned assistant surgeon to the Seventh Minnesota and departed for duty on the frontier where the Indian war was raging. In the fall of 1863 he went south and engaged in field service until the end of the war and was mustered out at Ft. Snelling August 18, 1865. In March, 1868, he went to California and engaged in newspaper work. In September, 1874, he was summoned to the death-bed of his father and, in company with Dr. Salisbury, took up his father's practice. A card in the *Minneapolis Daily Tribune* of May 25, 1867, announced that Dr. A. A. Ames will hereafter attend only surgical cases, diseases of a surgical nature and office practice, the first instance of surgical specialism I have found. He later

entered politics, and through his efforts the Minnesota Soldiers' Home was founded.

Dr. George Keith was born in 1825 and graduated from the Medical College at Woodstock, Vermont. After living in New York two years he decided to go to Minneapolis, where he had two brothers. In Minneapolis he began the practice of dentistry and medicine, but devoted his attention almost wholly to the former. He was a member of the First State Legislature of 1858-1859. During the Indian war of 1862, he was surgeon to the expedition sent to the relief of Ft. Abercrombie. In 1863 he was made provost marshal for the Second District of Minnesota, a position he retained until the end of the war. He resumed practice and was made postmaster in 1871 and reappointed in 1875.

Dr. O. J. Evans was born in New York in 1840, and graduated from the Albany Medical College of New York, and went immediately to the front as assistant surgeon to the Fortieth New York Volunteers. The following summer he became surgeon to the regiment and was detailed on the operating staff of the brigade, which duty he discharged until the end of the war, when he was made Chief of the Medical Department of Farnsville, Virginia, where there was a cluster of Confederate hospitals filled with Union and Confederate wounded. Of these hospitals he had general supervision. He took part with his regiment in the Grand Review in 1865 in Washington, and was mustered out some time later. In September, 1865, he came to Saint Peter, and ten weeks later removed to Minneapolis where he remained in practice up to his death on October 17, 1916. He served two terms as city health officer of Minneapolis, was a member of the Board of Education, and a member of the legislature, and was largely interested in business as well as in professional matters.

There are many other members of the profession whose experience in the war preceded their arrival in Minneapolis, and these include, among others, Drs. Abbott, DuBois, Phillips, Goodrich, and others.

Dr. C. G. Goodrich came to Minneapolis in 1868, and at once entered on an extensive practice. He was wealthy when he came, and invested largely in real estate. He was a modest, truthful, faithful, and generous man and was the first elected president of Hennepin County Medical Society following the death of Dr. Ames.

Daily Tribune, June 5, 1875:

"The fifth annual meeting of Hennepin Society was held at the office of Dr. Evans in his new block on Bridge Square last evening. Nearly all the members were in attendance, the meeting being particularly important and peculiarly interesting. Drs. R. J. Hill and A. H. Lindley were duly elected and installed members, after which the election of the officers for the ensuing year took place. The following was the result: President, C. G. Goodrich; Vice-president, O. J. Evans; Secretary, A. S. Salisbury; Treasurer, W. C. Bedford. At the close of the election Dr. Simpson, the retiring president, made a few apt and timely remarks as did also Dr. Evans, who, in the absence of the president in the east getting married, acted as presiding officer.

"The fee bill for the Society was discussed and slightly amended, among other changes it being resolved to charge an invariable fee of \$25 for holding a post-mortem examination.

"Dr. Clark was appointed essayist for the next meeting and Dr. Simpson for the one following, after which the meeting adjourned."

The above note on post-mortems may have some connection with the following very unpleasant article which had appeared in the *Tribune* of December 3, 1872:

HISTORY OF MEDICINE IN MINNESOTA

"The Minneapolis Post-Mortem Club.—The Club met today pursuant to adjournment, Dr. A. S. S. Jones in the chair. Dr. D. M. Phule, Secretary, read the minutes of the last post-mortem. Committee on Mortality reported two deaths since last meeting.

"Dr. I. M. Some introduced the following resolution: That the H. O. G., this city, be instructed to notify this Club of all deaths occurring within the limits of the city.

"And, resolved that for the benefit of science this Club shall immediately take possession of the bodies and post-mortem the same with as little delay as practicable, that being the only method of arriving at a correct diagnosis in any case.

"And, resolved that with the sole object of enlightening the benighted public upon scientific medicine, the proceedings of this Club be published in the daily papers in case they do so gratuitously. * * *

"Gentlemen, you befog your own brains. Every post-mortem made by this Club since the organization has ventilated your own ignorance. The people ask for a little more knowledge of disease before death and fewer post-mortems; for less advertising and less braggadocio and more careful, earnest practice. The disgusting frequency of post-mortems in this city is a disgrace to the profession, which the people will ere long rebuke."

It was about this time that Dr. Tanner, an herb doctor of Minneapolis, acquired widespread notoriety through his fasting demonstration, which appears to have been an advertising scheme carried on in Market Hall at Hennepin and First Avenue South. I have not located the exact date or description of Tanner's activities. After the close of his fasting*exhibition he went on the lecture platform, and seems to have disappeared from Minneapolis.

(To be continued in the February issue)

ARITHMETIC PROBLEM

If the average case of minimal tuberculosis admitted to the sanatorium stays eight months, and the average case of moderately advanced tuberculosis stays twenty-three months, how much could be saved by early diagnosis?

In Connecticut where it costs about \$1,000 to keep a patient in the state sanatorium for a year and where only 10 per cent of the admissions are in the minimal stage, it is estimated as hundreds of thousands of dollars by the Connecticut State Tuberculosis Commission.

Unfortunately, the situation in Connecticut is not unique among the states. Everywhere admissions to sanatoria are largely in the later stages, and everywhere the result is a longer hospital stay—a tragic waste whether human suffering, disability or money is considered.



BERTRAM S. ADAMS, M.D.
President, Minnesota State Medical Association

President's Letter

MEDICAL science today has attained its highest development in world history. Never before has the physician been able to do so much to aid the sick, injured or disabled.

Our own country leads the world in sickness prevention, in lowering the incidence of preventable disease, in reduction of time loss due both to injury and disabling disease, and in lengthening the average span of life. These things have been accomplished, in large measure, by our American system of medical practice which allows for freedom of action by the doctor and also provides the stimulus of competition.

These facts are everywhere acknowledged and, in spite of them, some of our people would do away with the American system of medical care and put in place of it some form of government controlled medicine, European style. Among those who clamor loudest for a change are the politicians who regard it as a source of votes and the social workers who see in it a means of obtaining unlimited medical care for the very poor, not realizing that it also means a cheap and inferior service.

We must remember that the European systems had their beginning with Bismarck, who needed votes to defeat the opposing political party in 1883; and that Lloyd George had the same objective when he started the Panel system in England in 1911.

We must remember that 1940 is election year in the United States, also, and we must watch out for comparable attempts to change our own system in the coming campaign.

Dr. Mountin, assistant to Surgeon General Parran of the United States Public Health Service, expressed his confident belief, on a recent visit to Minnesota, that the next Congress would pass a health bill. The Wagner bill of last year was a trial balloon only, he said; but even that bill would have passed if the usual pressure had been applied. Physicians' organizations were opposed to that bill and would be opposed to any measure drawn up on similar lines, not only because of the exorbitant costs but because they do not believe such a bill would aid good medical practice.

There is no doubt that medical practice has declined in efficiency wherever the government has been in control; that preventable diseases are increasing in prevalence in European countries; that time loss from disease and injury has grown; that medical services are poor in quality and that there is little incentive for the physician to study and improve himself. Not only is the service in general poor, but the doctors themselves are underpaid, overburdened with petty detail and forced to spend their time in making interminable reports. They are also forced too often to perjure themselves in making allowances for disability in order to retain their panel clientele and they must curry favor with politicians in the government positions. If another health bill is introduced this year in Congress it must be examined closely. If it is the Wagner bill of last year in new dress or a similar measure—every doctor must exert his utmost effort in time, money and public propaganda to defeat it.

BERTRAM S. ADAMS, M.D., President
Minnesota State Medical Association

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

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JANUARY, 1940

Number 1

1939-1940

WITH the arrival of a new year comes the
urge to reflect on the past year and to an-
ticipate the year to come.

World War II has been in progress for four
months with strange alliances and war activities
limited to the sea in a type of warfare directed
toward subjugation of the enemy through eco-
nomic pressure. A prolonged conflict can only
prove disastrous in its political, economic and
moral aspect to both winner and loser.

While our attention has been shifted from do-
mestic to foreign affairs, and we can feel truly
thankful that as a nation we are at peace with
the world, we have our own economic problems
which are vital in their importance.

On the pretext of emergency need Congress
has delegated its powers to the executive branch
of the government, which has been nothing loath
to apply experimental methods, which have large-
ly been contrary to established principles of
finance and the proper sphere of governmental
activities. As a result every type of business has
found the government a competitor. Proposals
such as the Wagner Bill have emanated from
governmental circles, involving the expenditure
of millions, yes billions, of the taxpayers' money
for the development of governmental activities in
medical care. As preparation for such activities
an attempt was made by the Department of Jus-
tice to discredit the medical profession. The re-
fusal of Congress to pass the Wagner Bill at the
last session offered proof of the tendency of
Congress to reassert itself. We have reason to
believe, however, that some proposal resembling
the Wagner Bill will again be introduced in the
Congress just convened. It behooves the medical
profession to make available the facts regarding
medical needs of this country and the type of
medical service which will best serve the country.
The A.M.A. has published its platform, so the
public knows our point of view. The National
Physicians' Committee for the Extension of
Medical Service affords the medium for dissem-
inating information and deserves the support of
the entire medical profession.

Medical care is one of the important items in
the life of any individual. Numerous European
governments have provided various types of
medical care for their citizens, none of which
would be acceptable to American citizens. We
fear that in the coming Republican and Demo-
cratic conventions the temptation to include a
party platform plank providing certain govern-
mental medical care will be too strong to resist.
If one party does so the other is likely to go the
first one better. The advisability of any such pro-
cedure should be decided on its merits and the

proposal should not be made a political issue in the coming election.

MINNESOTA MEDICINE wishes to take this opportunity of expressing to the officers and members of the Association its appreciation of the co-operation manifest the past year and in pledging its continued support of all of the activities of the Association the coming year, and to wish all our members a prosperous and Happy New Year.

CENTER FOR CONTINUATION STUDY

THE Center for Continuation Study at the University of Minnesota is unique. So far as we know there is no similar center anywhere in the country. The beautifully equipped headquarters building in the nature of a small first class hotel with moderate prices, the concentration of courses and the personnel of the instructors provides one desirous of adding to his knowledge in his particular field, the opportunity for doing just that at a minimum of time and expense.

A generation ago physicians found it worth while to take a trip to Vienna for a few weeks of postgraduate study. Then there was little opportunity in this country to obtain postgraduate work of high order in a short space of time. Now there is little or no opportunity abroad and teachers and material in this country are unsurpassed.

That the Continuation Center is dispensing postgraduate study opportunities of high order is attested by the enrollment so far. The program of the winter quarter appears in this issue. Full use will doubtless be made of the opportunity afforded general practitioners especially to obtain instruction in subjects of special interest.

THE MINNESOTA MEDICAL FOUNDATION

THE appearance of the first issue of the *Bulletin of the Minnesota Medical Foundation* in November, 1939, is evidence of beginning activities of the Foundation. In November, too, the first meeting of the Advisory Committee and others interested in this new organization was held on the University Campus and helped the Committee on Organization to draw up By-Laws.

The Foundation, as was stated in an editorial in our November number, is an organization of

medical alumni students and friends of the medical school of the University of Minnesota, whose purpose is primarily to further medical education in undergraduate, postgraduate and research activities.

The *Bulletin* will keep alumni posted regarding the activities of the medical school and the alumni. This, however, is only one activity of the Foundation. Contributions are being received, the income from which will be used to provide scholarships, loans to students and the means for carrying on medical research. Contributors of \$1,000 or more will be designated patrons, while life membership can be obtained through a contribution of \$100. A substantial source of support, however, will come from annual membership dues which have been set at \$10. While the organization provides the mechanism for the devotion of large bequests to medical progress in Minnesota, a large membership is absolutely necessary for its success.

Memberships may be obtained from the office of the Minnesota Medical Foundation, 132 Medical Science Building, University of Minnesota, Minneapolis.

CONSULTANTS

CONSULTATION is often desirable. Alas, consultation too often results to the detriment of the physician referring the patient. This should not be. The ideal relationship between physician and consultant results in help, not harm to the former.

Charlatans and quacks do not refer patients. Imitators of charlatans and quacks among inferior physicians do not refer patients. The higher type of physician is more apt to refer patients than the lower type. What leads him to refer a patient? It is honesty, conscientiousness, keen concern for the welfare of the patient, and desire to do the best for him. Referring a patient is not necessarily a confession of weakness nor of inferiority; it may be an indication of strength.

It is perfectly true that no higher motive than self interest need induce the consultant to be helpful to the physician who refers the patient. If confidence in the referring physician is augmented, he will be in a position to refer more patients.

More mistakes are made by the referring phys-

ician not accompanying the consultant in his visit to the patient. Physicians in the preceding generation were very meticulous in the manner in which consultations were carried out. The referring physician entered the room first and on leaving the room, followed the consultant. The reason was obvious. They then retired to discuss the patient in private. The discussion of the case in private was a fundamental part of the consultation which might well be perpetuated. Telling the patient about findings or giving advice on the part of the consultant is not to be tolerated unless he is specifically requested to do so.

The consultant must feel a kindly attitude toward the ability of the referring physician. After all, he may be the better physician. Any lack of respect for the referring physician is sure to color the consultant's remarks to the detriment of the former in the eyes of the patient.

The referring physician places a very precious possession in the keeping of the consultant: his reputation and prestige. The trust should not be betrayed. The consultant has a right to feel honored at being consulted. His words and actions should show every respect for the patient's physician. Any other attitude often acts as a boomerang to the discredit of the consultant.

The whole purpose of a consultation is the patient's welfare. Only by careful observance of the details mentioned will the patient obtain the greatest benefit from a consultation and credit accrue to both physicians.—C. G. K.

THE BACH TRADITION

BECAUSE there were forty-nine good musicians, twenty of them noted, in seven generations of the Bach family it has been very generally considered to be, as one writer states, "the most remarkable instance of hereditary genius in all history." It certainly looks like it, but one can't help but wonder if environment did not play an important part in the production of this remarkable situation.

They lived in an atmosphere of music, for Thuringia, where they were born and lived from generation to generation, was traditionally musical, and close by, in Saxony, was the most famous organ building district in the world. Then, from old Veit Bach, the baker who only played the zither in his spare time and died in

1619, down to the last Bach of any musical consequence, in a period of two hundred and fifty years, they lived in their own family atmosphere of music, teaching their younger brothers and sisters, their children and their children's children.

In this firmament of musical talent appeared a star of the first magnitude, the great Johann Sebastian Bach. In his period all musical instruments were still very primitive, as compared with those of today, and it is difficult to understand how he, thus handicapped, could produce music which today stands unmatched, at the very top. His preludes and fugues for the organ call for all the resources of the modern instrument and only a few performers can really play them. He was the father of twenty children, only two of whom became well known in music. In another hundred years the strain died out.

The question of environment is interesting in connection with this unique group of talented people and its single genius, but again we are puzzled when we think of the many others whose genius survived the most uncompromising obstacles. Perhaps it's the chromosomes, after all.

—G. C.

PRESCRIPTIONS REQUIRED

THE new Federal Pure Food, Drug and Cosmetic law is now in effect.

The F. D. A. has issued a regulation prohibiting the sale of the following drugs, except on prescription: acetanilid in combination with bromides if the dose is more than $7\frac{1}{2}$ grains a day, aminopyrine and its preparations, benzedrine sulfate, cinchophen and its preparations, neocinchophen and its preparations, sulfanilamide and its preparations, thyroid and its preparations.

Such a ruling is a step in the right direction in an effort to stop promiscuous use of drugs and self-medication.

To be effective 100 per cent, however, it is the duty of the physician to write prescriptions for the above mentioned drugs and the pharmacist shall not dispense these drugs except upon prescription.

Coöperation of all allied medical professions is needed in this work.

—J. S.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

OFF TO A GOOD START

The National Physicians' Committee for the Extension of Medical Service is off to a good start.

Information has been received to the effect that the movement is being enthusiastically backed by large numbers of physicians in all parts of the country. Not alone have they backed it with their moral support, but, to a surprising degree, with generous contributions. The widespread support of the objectives of the Committee promises well for its future success. While it is still in the formative stage, its future activities are already being planned.

Every member of the medical profession who sends in his name and contribution for membership automatically becomes a member of this nation-wide committee.

The active coöperation of every physician who enrolls will be sought. Literature will soon be sent out in a form attractive to the layman and all members of the Committee will be counted on for its distribution. The combined efforts of its membership should be a powerful factor in the future support of American medicine. Have you filled in your application blank?

A Minnesota Branch of the National Committee has been formed in order to expedite the activities of the National Committee. Its Executive Committee has had several meetings and will undoubtedly be of great aid in furthering the national objectives.

MINNESOTA BRANCH

It is of interest to note that the first state branch of the National Committee for Extension of Medical Care in the country was organized in Minnesota.

It was formed under the chairmanship of Dr. F. J. Savage of Saint Paul and now embraces as members and contributors, medical leaders from all parts of Minnesota.

The Minnesota organization will serve as the local agency for distribution of literature to members and it will enlist the aid of key representatives of the other professions who are interested as citizens and as professional men in the philosophy behind the physicians' movement.

To Spread Information

The Minnesota branch will carry out the general program of the national organization. It will throw its influence behind any local extensions of medical service that may be shown to be needed in Minnesota and it will spread information to all parts of the state on the kind and quality of services available in Minnesota; on the extraordinary progress made in Minnesota in the control of communicable disease and the lowering of maternal and child death rates. In these respects and in many other key tests of the adequacy of medicine and the public health services, Minnesota stands at or near the top among all the states of the United States. It is important for the citizens of Minnesota to be familiar with these facts so that social experiments in medicine with their dubious results elsewhere may be properly evaluated in the light of accomplishments here.

Committee Is Independent

It should be noted that the Minnesota branch of the National Committee of Physicians for Extension of Medical Care is in no way fostered by

nor subservient to the Minnesota State Medical Association. It is an independent committee of physicians, organized for special purposes and financed by contributions of its members.

THE COUNCIL MEETS

Marked expansion in the public health education program of the Minnesota State Medical Association will begin in several directions in 1940.

Information about the elementary principles of good health and about available medical services is regarded, on all hands, as an immediate and practical method open to physicians to aid in solving medical-economic problems.

There is a great weight of untreated illness due—not to lack of resources or lack of medical facilities—but to sheer ignorance and neglect.

For Public Education

Increase in facilities and increase in appropriations of funds will not lift this weight; but concentration by medical organizations upon the problem of public education is a step in the right direction and a step upon which all physicians now agree.

Accordingly the Council approved extensions in nearly all activities of the Committee on Public Health Education as follows:

1. A Question and Answer Column sponsored by the committee, will replace the regular health news story which has been sent each week to country newspapers in the state through the Minnesota Editorial Association. The new service will provide opportunity to rural newspaper subscribers to send their questions, a few of which will be published each week, to competent authorities for answer. Rural papers which cannot afford the syndicated health columns will thus receive a free, authoritative service.

To Aid Speakers

2. The Speakers' Library will be enlarged by lantern slides on popular subjects. Slides are frequently requested but until now no appropriations or facilities have been available for supplying them. Committee chairmen will be asked to aid the new Speakers' Library with outlines for specimen talks to accompany the slides.

3. The association's popular radio program conducted by Dr. W. A. O'Brien over WCCO will be enlarged to embrace the smaller radio

stations in many parts of the state. The question of whether local speakers should be utilized is being investigated; also the possibility of making recordings of Dr. O'Brien's talks for re-broadcasts over these stations.

The regular college lecture courses of the association will be continued and the committee will coöperate closely with the Committee on Hospitals and Medical Education and other scientific committees of the association to carry forward and amplify the Coördinated Medical and Public Health Program inaugurated with such success last January. Monthly packets will be continued for the year and the subjects drawn up at a preliminary meeting depart considerably from the 1939 subjects in order to insure interest for the 1940 packets.

"The Only Way . . ."

Minnesota physicians will coöperate closely with the newly organized Division of Social Welfare of the (Department of Social Security) in the solution of all problems connected with medical care of relief clients and recipients of the Social Security Aids.

An advisory committee of the state association was approved by the Council to meet regularly with social welfare officials, Mr. Walter Finke, director, and Dr. H. E. Hilleboe, medical chief. The committee is composed of the following: Drs. A. W. Adson, Rochester; L. L. Sogge, Windom; C. A. Stewart, Minneapolis; W. A. Coventry, Duluth; E. J. Simons, Swanville; with Dr. Hilleboe, Dr. A. J. Chesley of the State Board of Health, and Mr. R. R. Rosell as ex-officio members.

Working Method

A suggestion for a working method of bringing physicians and welfare boards together locally to handle joint medical problems was proposed by Mr. Finke in person to the Council and cordially approved. The County Contact Committees will figure in this plan when it is officially announced and their rôle will be to consult with local welfare officials on medical care for all welfare clients.

"There are many things we don't know yet about our medical relief problem in Minnesota," Mr. Finke told the Council. "We don't know how much money is being spent for medical care in this state, for one thing. We are going to try

to find out what is spent, however, and how it can best be spent. But we shall make no decisions and inaugurate no policies without consulting the medical profession. *As a professional man, myself, I am convinced that the only way we can arrive at a solution of our medical difficulties is through the medical profession.* We began our work by asking for an advisory committee from your body. We shall continue to work only through this committee and your association."

Teaching Demonstration

An obstetric teaching demonstration and home delivery service to be used in connection with obstetric teaching at the University Medical School was proposed by Dr. A. J. Chesley, secretary and executive officer of the State Department of Health, as a means of utilizing an appropriation which may be made available to Minnesota out of unexpended funds of the Children's Bureau, provided that agency approves the proposal. This teaching service would give medical students an opportunity, not now available, of making deliveries in homes in the vicinity of Minneapolis. The object is, of course, to prepare students for obstetrical emergencies they will meet in practice.

The Council expressed its interest and requested that the program be referred for approval to the Hennepin County Medical Society.

Does Not Initiate Legislation

The United States Public Health Service does not initiate legislation, Dr. J. W. Mountin, Assistant Surgeon General of the United States Public Health Service and guest of Dr. Chesley, informed the Council. "Legislation in social fields arises with outside groups and is often well on the way to committee hearings before health service officials are informed of it. As you know, we are specifically prohibited from either initiating or supporting any legislation and the policy of the Public Health Service is based upon programs formulated by state health officers."

On the other hand, the organization of State Territorial and Provincial Health Officers can and does take an active interest in legislation. For instance, the health officers' association is currently opposed to transference of Industrial Hygiene and Occupational Diseases from the public health service to the Department of Labor

and also to removal of the Division of Vital Statistics from the health service.

Cancer Education

Thirty thousand people all over the United States took part in the Women's Field Army Against Cancer program last year, according to Dr. F. L. Rector, field secretary of the American Society for the Control of Cancer, who spoke briefly on the work of the women's organization. Forty-eight thousand talks were given about cancer, 42,000 of them by physicians, the others being organization talks by society representatives. The new women's organization has been in existence for three years. It raised \$165,000 during its third year, of which 30 per cent went to the National Society for the Control of Cancer and 70 per cent was retained for local cancer education work. Some 4,000,000 pieces of literature were distributed on cancer last year and 1,500 exhibits were shown at fairs and meetings.

Neither the national cancer organization nor the Women's Field Army is in the clinical field, Dr. Rector said. Its program is entirely under control of physicians and no clinical use will ever be made of funds raised in Minnesota unless the Minnesota physicians ask for it.

To Study Fees

Fees for medical relief are far from uniform in various parts of the state. Discussion of inequalities and occasional difficulties that arise from them prompted a request by the Council for a study of the situation on the part of the Committee on Low Income and Indigent Problems. The committee will accumulate figures and data not only on fees but on all phases of the relief problems from the point of view of physicians. Information thus gathered will be presented at the County Officers' meeting scheduled for February.

New Committees

Two timely new committees have been appointed by President B. S. Adams with Council approval.

One of these, the Committee on Vaccination and Immunization, will take the lead in a coördinated state-wide effort on the part of members of the association to carry on community vaccination and immunization programs. Dr. L. R. Critchfield, formerly chairman of the Committee

on Public Health Education, was appointed to chairmanship of the new committee and a state-wide plan drawn up at the request of the Council by Dr. C. A. Stewart of Minneapolis, was tentatively approved and referred to the new committee.

The second is the Committee on Industrial Hygiene and Occupational Disease, of which Dr. J. L. McLeod of Grand Rapids will be the first chairman.

For Civil Service

A special committee will also be appointed by the president and the chairman of the Council to work with the new Civil Service Board in drawing up examinations for physicians who engage in state institutional work.

Public Health Meetings Approved

An expression of official approval for promotion of vaccination and immunization was requested by the State Sanitary Conference at an earlier meeting. The approval of the Council was given and the recommendation made that county and district medical societies hold at least one meeting each year on public health problems. Speakers for these meetings will be provided on request by the State Board of Health.

ON MEDICAL ECONOMICS

Following a plan developed with great success two years ago, subcommittees of the Committee on Medical Economics met separately and then joined in a general dinner meeting of the entire committee recently in Saint Paul.

Below are brief abstracts of reports made by subcommittee chairmen at the dinner.

We Are Fortunate

Dr. W. F. Braasch, chairman: A thorough trial is being made of health insurance by medical societies in many states. We are fortunate in Minnesota that no political emergency exists which might serve to push us into premature experimentation with these new forms of service. Our best policy, it seems to me, is to watch developments in other states and avoid costly experiments.

In the meantime, it appears that a closer cooperation is highly desirable between physicians and county welfare boards throughout the state.

This is one effective method of seeing that the under-privileged receive adequate medical service under our present system of practice in Minnesota.

For Up-to-date Information

Dr. W. A. Coventry, Duluth, chairman of the Sub-Committee on Low Income and Indigent Problems: At the direction of the Council, a questionnaire has been compiled to send to all members of County Contact Committees. By means of this questionnaire we hope to get up-to-date information on details of handling medical relief in all parts of the state so as to lend assistance where it may be needed.

In that connection it is interesting to note that physicians in Wright county, after careful study of the plan, decided not to enter into any co-operative arrangement with the Farm Security Administration to provide medical care for Farm Security clients (See *Medical Economics Section* for December). Existing machinery was regarded as adequate to care for these clients and the need was not acute enough to warrant so uncertain a departure from ordinary methods of care.

Marked Progress

Dr. B. J. Branton, Willmar, Chairman of the Medical Advisory Committee: The Medical Advisory Committee has made demonstrable progress, as witnessed by the greatly improved malpractice situation in Minnesota. The work of the committee is particularly noticeable in the decided change which has come about in the last few years in the attitude of lawyers toward the medical profession. In marked contrast to the condition a few years ago, there is now close coöperation between the two professions.

Clinics Planned

Dr. T. H. Sweetser, Minneapolis, Chairman of the Sub-Committee on State Health Relations:

The American Legion plans to launch a program of child welfare which is to provide speakers on child welfare and Child Welfare Clinics in Minnesota. If the plan is carried through, it should be done with caution and with strict medical supervision. It is our suggestion that the clinic program be referred to the Committee on Child Welfare of the Committee of Public Health Education for study with the recommen-

dation to the Legion that nothing be done without consulting the Child Welfare Committee.

Problems in Ethics

Dr. L. A. Buie, Rochester, Chairman of the Sub-Committee on Medical Ethics:

I believe that this committee has a function and that something valuable can come from its work, in spite of the fact that there was a negligible response to a letter sent to all county medical secretaries by this committee asking for information concerning infringements of the code of ethics. A few instances have come to our attention through other sources and the members involved have been interviewed with entirely satisfactory results. It needs only a slight infringement of ethics to produce a malpractice case and anything that we can do to prevent such infringements is of great assistance to the individual involved, as well as to the organization. It has been suggested that we might draw up artificial problems based upon actual instances and publish them for the information of all members in MINNESOTA MEDICINE.

Position Endorsed

Dr. Stephen Baxter, Minneapolis, Chairman of the Sub-Committee on Industrial Relations: Relations between the profession and the better insurance companies are satisfactory. The committee fully endorses the position of the state society against the practice of medicine by fraternal orders.

INSURANCE PITFALLS FOR PATIENTS

The success of the non-profit Minnesota Hospital Service Association has pointed a new way to profit for commercial insurance companies.

These companies are writing hospital insurance policies for a large number of persons, and physicians who are asked about these policies should be informed of possible pitfalls into which unwary subscriber-patients may tumble.

The financial standing of any insurance company can be checked with the insurance commissioner but it is also necessary to study the policy and methods even of the most reliable of them.

All policies make certain necessary restrictions upon payment of benefits, some more than others. In most cases it is important to study the policy closely since many exceptions are cloaked

from casual perusal and appear to leap into being only when benefits are refused.

Sinus Rider

Still others appear to have a disconcerting habit of attaching riders to the original contract and sending them to the subscriber *after* his application is made and noted and the premium accepted. Thus, there is one recent instance on record of a subscriber who had noted a sinus infection in her application. The sinus infection was the only ailment she had been obliged to report in her application. The first policy shown her had contained no mention whatever of sinus infection; but a rider which informed her that hospital benefits would not be paid for sinus trouble was attached to the policy sent her afterwards from the main office.

If she had confessed to dyspepsia or rheumatism or fallen arches a different kind of rider might conceivably have accompanied her policy.

Mail Order Business

The company which sold the policy minus sinus privileges is actually old and reliable and well known. Other companies which may or may not be approved by the insurance commissioner are now embarking upon a mail order business in hospital insurance in order to take full advantage of what looks like a profitable field.

It works this way. The applicant sees an advertisement, writes for information and receives, along with a contract, a glowing promise of coverage for *all* hospitalized illness plus the doctor's bill while he is in the hospital, all for \$3.65 a quarter. He signs and returns to the company the sheet which bore the sweeping promises. He retains in his possession only the policy which, on closer inspection, reveals that benefits are actually available only to the fortunate and the adroit. The owner of this policy is protected against hospital bills for all illnesses except peptic ulcer, cancer, heart disease and accidents due to external violence, to name only part of the exceptions—a complete list of which covers most of the afflictions which get people into hospitals. It is part of the mail order technic that the policy should be in force and the applicant liable for the premiums if the policy is not returned to the insurance company within ten days. Thus, through carelessness or accident the hapless answerer of "ads" may find himself the unwilling owner of an all but worthless document for which he will pay an exorbitant fee.

Coverage for Doctor

It should be noted in considering abuses of hospital insurance that there are also non-profit plans in existence which offer as an additional attraction, a partial coverage of the doctor's bills while the subscriber is in the hospital. It is too soon, perhaps, to judge of the practicability of this extra coverage but the result in a number of cases has not been all that the sponsors anticipated. The allowance for the doctor's bills is, in most instances, partial and inadequate but the patient upon receiving a larger bill, has objected strenuously and refused to pay. Naturally, he believed that he had purchased complete protection against his bill.

Minnesota Hospital Service is in a far better position because it has hesitated to offer any coverage that fringes upon insurance for medical services.

"WHY THE MEDICAL ADVISORY COMMITTEE"

[Monthly Editorial Prepared by the Medical Advisory Committee]

Recently, the chairman of The Medical Advisory Committee was asked: What is the function of The Medical Advisory Committee?

In the constitution and by-laws of the Minnesota State Medical Association adopted May, 1937, it is stated that: "Its function shall be to investigate and disseminate knowledge as to the cause of malpractice."

It is, therefore, a fact finding committee as well as a correlator and dispenser of the information gained through investigations. It is in no way an insurer against malpractice, pays no indemnities and gives no legal advice.

As has been said, experience is a good and probably the best teacher. So it has been with your committee. The general knowledge of cause and cure of the malpractice menace gained by the committee in the last several years should and will be of inestimable value to the Association and its members in the solidifying of the membership behind its objectives, and concretely showing a result in lessened premiums paid by the members for protection.

Continued observation of the general attitude of the membership shows a coöperative spirit which we believe is probably more noticeable than in any other profession, a growing criterion of good brotherhood.

Your committee believes that common sense is an indispensable part of its work; that a clear analysis of various problems as they arise is proper and just; that there are two sides to every case; that the great majority of the membership of our Association are honest with their clientele; that most members of the Bar Association would not bring an action against our profession if they were given the true facts in a case by the plaintiff; and that a miscarriage of justice in the courts of our state in this type of a case is at a minimum. Study shows it to be a fact that those things of common interest to us all are much more important and essential than our differences.

B. J. B.

TAKE YOUR CHOICE

There are interesting discrepancies between the book on Soviet medicine by Medical Historian Henry E. Sigerist of Johns Hopkins and the account of personal experience with Soviet medicine published a few years ago by one-time communist newspaper correspondent, Eugene Lyons.

Say Dr. Sigerist:

"Nobody can deny that Soviet medicine, in the short period of twenty years and under most trying circumstances, has stood the test and has created powerful measures for the protection of the people's health. It has demonstrated that socialism works in the medical field, too, and that it works well, even now, in the early beginnings of the social state. It is a system full of promise for the future—the very near future."

Says Mr. Lyons:

"We came, unluckily (through illness of Mrs. Lyons) to know a lot more about Soviet medical practice than most of our colleagues. Like the "stable" currency and the wonderful educational methods, socialized medicine under the official statistical surface was a snarl of contradictions, shortages and ineptness. Doctors and dentists regarded their obligatory work for the state as exaction and depended on private practice for their real income. The more famous medical specialists did not budge for less than 50 or 100 rubles; often it required pull to get their services at any price. The public health service was by all odds inferior to the free public and charitable health services available to the poor in cities like New York and Chicago. . . ."

"Ever after (Mrs. Lyons' experience in a Soviet hospital), the glowing reports of socialized medicine in Russia in American books and magazines have been a source of amusement to us. Always we have wished their authors only one punishment—a week or so as patients in the second-best hospital in Russia."

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Minneapolis Physician Sentenced to 5 to 20 Years at Hard Labor Following Conviction for Manslaughter

Re State of Minnesota vs. R. J. C. Brown, M.B.

On November 25, 1939, Richard J. C. Brown, Negro physician of Minneapolis, was sentenced to a term of not less than 5 and not more than 20 years at hard labor in the State Prison at Stillwater, Minnesota, by the Honorable Arthur W. Selover, Judge of the District Court of Hennepin County, following Brown's conviction, on November 22, 1939, by a jury, of the crime of manslaughter in the first degree. Brown was arrested on August 16, 1939, by the Minneapolis Police Department on the complaint of the father of a 22-year-old Minneapolis girl, upon whom it was alleged that Brown had performed a criminal abortion on July 31, 1939. At that time, Brown was charged with the crime of abortion. However, the girl died at the Minneapolis General Hospital on August 23, 1939, and prior to her death she made a statement naming Brown as the one who had performed this criminal abortion. Subsequently, Brown was indicted on August 29, 1939, by the grand jury of Hennepin County along with one Martin Schmidt. The indictment charged them with manslaughter in the first degree. Both defendants entered pleas of not guilty and their bond was fixed in the sum of \$5,000.00 each. Brown's trial commenced in the District Court on November 16, 1939, and ended with the jury returning a verdict of guilty on November 22, 1939. Brown did not take the witness stand in his own behalf. The defendant Schmidt was named by the deceased girl as having recommended that she go to Brown, and as having furnished her with the \$25.00, which it is alleged was paid to Brown for his services.

The defendant Brown was born in Lincoln, Nebraska, January 17, 1893, and graduated from the University of Minnesota June 17, 1920, with the degree of Bachelor of Medicine. He was licensed in June, 1920, by the Minnesota State Board of Medical Examiners by examination. According to the records at the University of Minnesota, Brown never completed his internship and the degree of Doctor of Medicine was never conferred upon him. Judge Selover granted Brown a stay of execution of sentence until December 30, 1939, to permit the defendant to make a motion for a new trial.

A real campaign against tuberculosis demands a genuine investigation carried out with general practitioners looking for patients in the community, in industry and in home-making. We are finding an appreciable amount of tuberculosis through testing campaigns in schools but it is not one-quarter of what we would find if the campaign were extended to the groups where tuberculosis is more prevalent.—LONG, ESMOND R., Phila., Tuber. Conf., 1939.

OF GENERAL INTEREST

Dr. John Arthur Williams, who for the past four months has been associated with his uncle, Dr. L. A. Williams, in the practice of medicine in Slayton and vicinity, has accepted a position as surgeon in Gillette Hospital, Saint Paul.

* * *

Dr. John W. Johnson, son of Dr. and Mrs. Hans Johnson of Kerkhoven, who has just completed a year as resident physician at the Wyandotte General Hospital, Wyandotte, Michigan, has returned to Kerkhoven, where he will be associated with his father in general practice.

* * *

Dr. Milo H. Larson, formerly of Nicollet, is now located at Norwood, Minnesota.

* * *

Dr. L. R. Parson, formerly of Fergus Falls, is now practicing medicine in Elbow Lake, Minnesota.

* * *

Dr. Norman Sather, who recently completed a residency at Ancker Hospital, Saint Paul, has established offices in McIntosh, Minnesota, for the practice of medicine.

* * *

Dr. A. F. Adair has recently completed his residency in the Eye, Ear, Nose and Throat department at the Ancker Hospital, Saint Paul, and is now associated in the practice of this specialty with Dr. Carl L. Larsen, 1027 Lowry Medical Arts Building, Saint Paul.

* * *

Dr. William C. Bernstein of New Richland has sold his practice and will enter the Graduate School of Medicine at the University of Minnesota, where he will specialize in proctology.

Dr. Russell O. Spittler of Livingston, Montana, took over Dr. Bernstein's practice January 1. Dr. Spittler is a graduate of the University of Minnesota, 1932, and has practiced medicine and surgery at Livingston since 1933.

* * *

Dr. Richard Cranmer and Dr. Leo W. Fink of Minneapolis addressed the Scott-Carver Medical Society at New Prague December 12. They spoke on "Acute Conditions of the Abdomen" and "The Important Functions of the Nose," respectively.

* * *

Dr. Frank E. Burch, Saint Paul, sailed December 15 from San Francisco for Peiping, China, where he will spend four months as visiting professor of Peiping Union Medical College. He is being sent to China under the auspices of the Rockefeller Foundation. Mrs. Burch accompanied him.

In Memoriam

Charles E. Fawcett

(1869-1939)

Dr. Charles E. Fawcett of Stewartville, Minnesota, passed away at his home Friday, December 8, 1939, at the age of seventy.

Born in Marion, Minnesota, October 13, 1869, Dr. Fawcett attended rural schools and later went to Winona normal school and to Darling's business college in Rochester. After teaching several years he decided to study medicine and he completed his course at Northwestern University in Chicago in 1893.

Upon receiving his M.D. degree, Dr. Fawcett began practice in Austin, Minnesota, but after three months, he moved to Stewartville and practiced there continuously until his death.

On November 28, 1894, Dr. Fawcett married Myrta A. Phelps. Three daughters, Gale C., Lois M., and Frances, and one son, Donald N., were born of this union. Mrs. Fawcett died in 1910. In 1913, Dr. Fawcett married Mabel Bates Slater.

Dr. Fawcett was active in his community. He gave much of his time toward bettering the local schools and is credited with having been responsible for the fine local school system.

He was an active Mason and was Worshipful Master of the local lodge for four years. He was also a member of the Modern Woodmen of America. Although beyond the draft age, Dr. Fawcett volunteered during the World War and served as Captain in the Infirmary at Alexandria, Louisiana. A charter member of the Ivan Stringer post of the American Legion, Dr. Fawcett served for many years as Chaplain, the post he held at the time of his death. It was fitting, therefore, that the Captain be given a full military funeral at Woodlawn Cemetery.

A Methodist from childhood, Dr. Fawcett transferred his membership from the Marion church and served on the Church Board for forty-four years at Stewartville.

Since 1907, Dr. Fawcett had been president of the National Bank at Stewartville, where his keen knowledge of financial affairs served his community well. Six years ago tribute was tendered him for this phase of his community activity by men and women of Stewartville.

Dr. Fawcett had long been a member of the Olmsted-Houston-Fillmore-Dodge County Society, and the Minnesota State and American Medical Associations.

I used to wonder why people should be so fond of the company of their physician 'til I recollected that he is the only person with whom one dares to talk continually of oneself, without interruption, contradiction or censure.—HANNAH MORE.

PERFORATION OF MECKEL'S DIVERTICULUM BY FISH BONE

(Continued from Page 44)

through the present opening so this was closed and a right rectus incision was made. A Meckel's diverticulum about 2.5 inches long, then came into view, a little more than 1 inch in width at the widest point and at the base about 0.5 inch. In sponging out the fluid the gauze sponge caught on something sharp and with the aid of an artery forceps this sharp foreign body was pulled out of the side of the appendage about one-half inch from the tip. This proved to be a fish bone about an inch in length. The diverticulum was tied off and removed, the stump inverted and covered over as in the usual appendectomy operation. Drains were put into the pelvis and after a few stormy days following the operation the patient made an uneventful recovery, and in five weeks was back on his rural mail delivery job.

In questioning the patient he said that he not eaten any fish since last February or the first part of March and the fish bone must have been in the diverticulum at least since this time.

Summary and Conclusions

1. A short anatomical description of the anomaly of a Meckel's diverticulum has been given.

2. The patient had had typical symptoms of appendicitis ever since he was fourteen years old, but undoubtedly had a recurrent diverticulitis until a fish bone found its way into the diverticulum and burrowed its way through the various coats.

3. The fish bone must have been lodged in the diverticulum for at least six or eight weeks and during that time he had had no symptoms of it until the typical pain which he had had so many times during the past forty-eight years recurred with increased severity.

4. Although the incidence of Meckel's diverticulum is 2 per cent, and the percentage of those which cause trouble is very small, it is well to keep this condition in mind especially in cases in which there is a long history of repeated symptoms resembling those of appendicitis. Furthermore if such cases come to operation and the appendix is found not to be sufficiently diseased to explain the symptoms, exploration should be performed in order to eliminate the presence of a Meckel's diverticulum.

5. A fish bone perforation of a Meckel's diverticulum is rare; at least I have not been able to find the history of such a case in medical literature.

The State of Massachusetts has recently passed legislation which makes it possible to protect its citizens in medical affairs. Hitherto there has been no provision for examining candidates for licenses to practice medicine except by a written test—a method of determining competence considered inadequate by all other states. Now Massachusetts is requiring that those who take the licensing examination must be graduated from approved medical schools.

A board, which has the authority to formulate standards in medical education, has been organized and will pass on the qualifications of schools of medicine. Massachusetts is to be congratulated upon this step which raises the qualifications of its medical practitioners to the general level prevailing throughout the United States.—Editorial, Jour. A.M.A.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR JANUARY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters), and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

January 6—Diphtheria and Smallpox.

January 13—Whooping Cough and Scarlet Fever.

January 20—Measles and Chickenpox.

January 27—Orthodontia.

NOTE: The last talk each month is sponsored by the Minnesota State Dental Association.

STATE MEETING

A new program plan will be followed for the next Annual Meeting of the Minnesota State Medical Association, 87th in the history of the association, which will be held at the new Mayo Civic Auditorium at Rochester, April 22, 23 and 24.

A group of special subjects has been chosen for the Tuesday and Wednesday programs and three or four speakers will be invited to talk on various aspects of each one. Among the subjects to be discussed from various points of view are Pre-Operative and Post-Operative Care; Coronary Disease; Cancer of the Breast; Progressive Loss of Vision; Fractures.

Monday's program will be given over entirely to members of the Mayo Clinic and at the conclusion of the day's proceedings there will be an open house with the clinic members as hosts in the Auditorium Arena. Exhibits will be open on this occasion and entertainment and refreshments provided.

Among distinguished out-of-state speakers who have already accepted invitations to speak are Drs. Harry E. Mock and Fred L. Adair of Chicago; and Dr. John O. Bower of Philadelphia.

The round table luncheons which proved a popular feature of the Minneapolis meeting will be continued this year with ten luncheons scheduled for each day of the meeting in Rochester hotels and dining rooms. Tours will also be arranged during the three days in groups of twenty for those who want to visit the Institute of Research. The annual banquet will be held at the Rochester State Hospital, Tuesday evening.

Special entertainment will be provided also for the Women's Auxiliary of the association, which will hold its annual gathering during the three days of the meeting. All wives of physicians will be invited to these functions.

WASHINGTON COUNTY SOCIETY

The Washington County Medical Society held its annual meeting on Tuesday, December 12. The following officers were elected by acclamation: President, D. Kalinoff; first vice president, Ray G. Johnson; second vice president, George McC. Ruggles; secretary-treasurer, E. Sydney Boleyn; delegate, E. Sydney Boleyn; alternate, Wade R. Humphrey.

Dr. Everett K. Geer of Saint Paul and Pokegama interpreted thirty-three chest radiographs from positive Mantoux reactors at the Stillwater High School. No lesions were demonstrable. Dr. Geer opined that positive reactors to the Mantoux test showing no demonstrable lung lesions should be referred to the family physician for very thorough general examination as tuberculosis may be present in some other part of the body. He cited several cases which proved such procedure would be very desirable.

MIDWESTERN FORUM ON ALLERGY

The second annual conference of the Midwestern Forum on Allergy will be held at the Palmer House, Chicago, Saturday and Sunday, January 13 and 14, 1940.

The meeting opens Saturday evening, January 13, with the annual get-together at 7 P. M. Saturday evening, Sunday morning and Sunday afternoon will be devoted to the scientific program covering numerous phases of allergy.

The profession of Minnesota is cordially invited to attend.

E. STARR JUDD LECTURE

Dr. Edward D. Churchill of Boston, Massachusetts, John Homans, Professor of Surgery at the Harvard Medical School, and Chief of the West Surgical Service at the Massachusetts General Hospital, will give the seventh E. Starr Judd lecture at the University of Minnesota in the Medical Science Amphitheater on Thursday, March 14, 1940, at 8:15 P. M. The subject of Dr. Churchill's lecture is "Surgery of the Lungs."

The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

MINNESOTA RADIOLOGICAL SOCIETY

The fall meeting of the Minnesota Radiological Society was held in Rochester, Minnesota, December 2, 1939. The scientific program was given at the Assembly Room of the Mayo Clinic in the afternoon. Following dinner at the Hotel Kahler, the members were addressed by Dr. H. M. Worth on the subject "Radiology in England," and Dr. Shao-hsun Wang on "The Practice of Medicine in China."

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, October 5, 1939

President, Dr. Willard White, in the Chair

Secretary: Dr. Harvey Nelson

CHRONIC DUODENAL STASIS

ARTHUR METZ, M.D.
Chicago, Illinois.

Chronic duodenal stasis is a condition characterized by the delay in passage of food through the duodenum. It has long been recognized but the condition is frequently overlooked in routine examinations. During the past twenty years, articles have appeared from time to time describing the condition and treatment outlined.

Etiology.—The etiology of duodenal stasis may be due to either a congenital anomaly with a resulting pressure on the duodenum where it passes over the spine, causing an incomplete obstruction, or it may be secondary to some mechanical obstruction such as tumor growths or adhesions.

The most common cause of stasis in our experience has been pressure on the duodenum where it passes over the spine by the mesentery attachment. It is usually associated with a ptosis of the abdominal viscera. In all of our cases we could account for the symptoms as being directly due to this cause.

Devine has described a type of duodenal stasis which he considers due to an abnormal action of the sympathetic nerves, for which he has devised a special operation consisting of a resection of a portion of the stomach.

Acquired obstruction secondary to tumor growths or adhesions or kinks can produce similar clinical findings.

It is difficult to estimate the frequency of chronic duodenal stasis secondary to congenital anomalies, for unless the clinician and roentgenologist make a careful search, many of the milder cases are overlooked. It has been estimated that about one-half of one per cent of all routine gastro-intestinal examinations in the x-ray department will show evidence of duodenal stasis.

Discussion of this paper will be limited to thirteen operative cases where the obstruction was found to be due to pressure on the duodenum by the mesentery attachment.

The age of the patients in this group was from fourteen to sixty years, the average being thirty-one. There were six males and seven females, all of whom were of the slender, undernourished type.

Symptoms.—The symptoms of duodenal stasis depend upon the degree of obstruction. When the obstruction is slight, symptoms vary from time to time and consist chiefly of recurrent attacks of nausea associated with a loss of weight and inability to carry on usual activities secondary to weakness occasioned by restriction of food.

In the more advanced cases, there is, in addition to the attacks of nausea, vomiting and a fullness in the right upper abdomen, which comes on immediately after starting to eat. The patient as a rule does not describe the sensation as pain but complains of a fullness which develops in the right upper abdomen soon after starting to eat, associated with the loss of appetite and inability to continue eating. These symptoms may become so pronounced during the first five or ten minutes that the patient is forced to end the meal for fear of vomiting. Pain may be present and inasmuch as it is localized in the right upper abdomen may suggest the presence of a gallbladder attack, but on examination there will be an absence of definite tenderness and rigidity which is characteristic of gallbladder disease.

In the more advanced cases the symptoms as above described increase in severity, so that the patient will avoid food, as there is the repeated feeling of nausea and vomiting when taking small amounts. In some cases the patient will attempt to eat frequent small meals so as to avoid distressing symptoms of repeated vomiting attacks.

Inasmuch as the patient shows no evidence of temperature, and blood and other laboratory findings are negative, the condition is sometimes looked upon as an hysterical vomiting, and as result the patient may receive very little sympathy or attention. This was true of one case that came under our care of a young boy, fourteen years old, where the attending physicians along with the parents had labeled the patient's symptoms as hysterical in character although the patient was extremely emaciated and exhausted before his true condition was recognized.

The diagnosis of chronic duodenal stasis is made by the history of recurring attacks of vomiting, which vary with the degree of obstruction, with the absence of other clinical findings suggesting an inflammatory lesion in the upper abdomen.

A positive diagnosis has to be made by careful fluoroscopic examination. The stomach will be observed as a long, vertical, J-shaped type, with a low placed outlet, and on watching the barium pass through the outlet, it will be found to remain in the duodenum to the right of the spine. The most striking finding is that of a duodenal shadow which is two to three times its usual diameter, and vigorous peristaltic waves are observed. The peristaltic waves may even assume the reverse type and the barium can be observed to return into the stomach. In some cases the barium will pass to the left of the spine after the peristaltic waves have been observed for five to ten minutes. The patient can definitely locate the area of fullness in the right upper abdomen at a point over the distended

duodenum and may even complain of the discomfort as that of a definite pain.

From fluoroscopic examination alone, duodenal stasis can be roughly placed into one of three classes:

1. Where there is a slight delay in barium passing through the duodenum, and after a minute or two it will pass to the left of the spine and the stomach will continue to empty itself.

2. Where there is a definite dilatation of the duodenum to at least twice its normal diameter and a delay of barium may be of five to ten minutes duration with evidence of reversed peristalsis associated with nausea and vomiting at the time of examination.

3. Where the obstruction is practically complete and dilatation is greater with pronounced regurgitation and vomiting and the patient shows marked emaciation. It is in this third group that prompt surgical treatment is indicated.

Differential diagnosis will have to be made from chronic gallbladder disease, duodenal ulcer and also from other anomalies such as diverticuli and cysts in the right upper abdomen, which should be easily eliminated by two or three repeated fluoroscopic examinations.

Treatment.—The treatment depends upon the degree of obstruction present. In the first stage where obstruction is only slight and the symptoms come and go, careful medical management by regulating the intake of food associated with rest at meal-time will frequently produce the desired results. The object of the treatment is to increase the weight of the patient so as to increase the amount of fat in the abdomen with the hope that the pressure on the duodenum will be reduced and in this way relieve the mechanical narrowing of the lumen.

In the second stage where the symptoms of fullness associated with nausea and vomiting are persistent, the patient should be kept in bed and given frequent feedings of nourishing food. Various positions should be tried during and after eating with the hope of relieving pressure and aid in the passing of food over the spine. Sometimes lying on the left side or with face downward will give relief and even the knee-chest position has in some cases given very satisfactory temporary results.

If the patient does not make satisfactory progress in one or two months after careful medical management, surgical treatment is indicated.

In the third stage where there is a high-grade obstruction due to pressure, a course of medical management might be tried, but with pronounced symptoms of vomiting and loss of weight the patient should be given prompt relief by surgical treatment.

Surgical Treatment.—The most common surgical treatment recommended for chronic duodenal stasis is duodenojejunostomy. This operation when properly performed will give very good results. In making the enterostomy, care should be observed to make the opening large so as to give prompt emptying of the distended duodenum.

The duodenum to the right of the spine is located

retroperitoneal, which places it deep in the abdomen and makes the operation difficult, as extra dissection is required to mobilize the intestines enough to do an enterostomy.

A second surgical procedure can be considered in giving relief which consists of a regular posterior gastroenterostomy accompanied by the placing of a silk ligature firmly about the pylorus. In these patients where the stomach is large, a posterior gastroenterostomy is much easier to perform than a duodenojejunostomy. The placing of a heavy silk ligature about the pylorus, tying it just tight enough to obstruct the lumen and not tight enough to produce a necrosis, will prevent gastric contents from entering the duodenum, thus making the food enter the duodenum to the left of the spine, after which it has no obstruction to its course through the intestinal canal. In our experience this has been a very satisfactory surgical procedure.

In our series of thirteen cases, ten were relieved by the use of gastroenterostomies and placing of silk ligature about the outlet. All ten patients made uneventful and good recoveries and have been able to continue their normal activities.

The first and the most severe case was a patient, fourteen years of age, who was operated upon twelve years ago. He was almost moribund at the time due to dehydration, so that he was a poor surgical risk. Owing to his weak condition, it was decided to do the simplest operation possible in order to get food into his small intestines. To accomplish this it was decided to do a gastroenterostomy and tie off the pylorus, as this seemed easier to do than a duodenojejunostomy.

Inasmuch as this patient made a very prompt and good recovery, it was decided to use a similar operative procedure on subsequent cases as they occurred, averaging about one a year. This accounts for the large proportion of gastroenterostomies as compared with duodenojejunostomies.

The most recent case was a duodenojejunostomy where a generous opening was made and the patient made a good clinical recovery.

Our first operative experience with this condition dates back to 1927 where a patient was diagnosed acute duodenal regurgitation in which a duodenojejunostomy was done but apparently in this patient the opening was not large enough so that although the patient got some relief, she never was completely well.

A second patient a year later was operated upon, at which time a duodenojejunostomy was performed and apparently in this patient the opening was not large enough, as the symptoms persisted. The patient was operated upon a second time and a gastroenterostomy was performed, the pylorus being ligated. This gave the patient better results, but here again after the second operation the patient never got entirely well as she was constantly complaining of fullness and occasional vomiting and regurgitation of food. When the patient was observed under the fluoroscope, the barium passed out of the stomach into the small intestines through the gastroenterostomy opening and was observed to go in both directions. In order to keep

barium out of the proximal loop, it was decided to do a third operation which consisted of placing a silk ligature just proximal to the gastroenterostomy opening. In this way all food was kept out of the duodenum for she then had a silk ligature at the pylorus and one proximal to the gastroenterostomy. The duodenum was then used only as a duct for the bile which mixed with the food stream through the former duojejunostomy opening.

At the time of the third operation, an opportunity was had to inspect the silk ligature that had been placed about the pylorus some seven months previous and it was found to be in good condition and walled off.

We have a series of fifty-one patients in which the pylorus has been ligated with silk for either duodenal regurgitation or duodenal ulcer and in no case have we had any evidence of bad effect.

Our operative experience on fifteen cases of duodenal regurgitation during the past twelve years has recalled to our mind at least two cases that were not recognized some twenty to twenty-two years ago. One of our prominent clinicians used to repeatedly state "how nice it would be if our foresight could be as good as our hindsight." We can recall two young women who were under the care of two of our leading clinicians with a pernicious type of vomiting and at that time we were unable to locate the cause. As a result of our later experience, beginning twelve years ago, in recognizing a duodenal regurgitation, it is evident that if the first two cases had been recognized, surgical treatment could have been employed and relief obtained. Both patients had been fed for months through a duodenal tube but gradually progressed to exhaustion and death.

Conclusions.—It is important to recognize the condition of chronic duodenal stasis which is characterized by recurring attacks of vomiting associated with loss of weight and that the diagnosis depends essentially on a careful fluoroscopic examination. It is important that the roentgenologist always be on the alert to follow the barium through the duodenum and be on the lookout for a dilated duodenum and peristaltic waves with delay of the passing of barium through the duodenum.

When the condition is recognized and it is not too advanced, medical management should first be used, but if satisfactory results are not obtained, surgical treatment should be resorted to.

The surgical treatment is optional and may consist in either a duojejunostomy, making sure that the enterostomy is made large, or a posterior gastroenterostomy and tying a silk ligature about the pylorus just tight enough to obstruct the lumen and not tight enough to produce a necrosis.

Motion pictures of an African big game hunt were shown by Dr. Metz, who had been a member of the hunting party which took a trip to the Tanganyika Territory in Africa. The pictures were taken by a professional photographer.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE ESOPHAGUS. Porter P. Vinson, B.S., M.A., M.D., D.Sc., F.A.C.P. Professor of Bronchoscopia, Esophagoscopy and Gastroscopy, Medical College of Virginia. 224 pages. Illus. Price, \$4.00, cloth. Springfield, Ill.: Charles C. Thomas, 1940.

AN INTRODUCTION TO MEDICAL MYCOLOGY. George M. Lewis, M.D., and Mary E. Hopper, M.S. 315 pages. Illus. Price, \$5.50. Chicago: Year Book Publishers, 1939.

This monograph of approximately 300 pages, should be of great interest to both practitioners and students. The subject matter is handled deftly and completely, yet brevity is the keynote throughout the entire work so that reading is not tiresome. There is ample practical information concerning the diagnosis and therapy of the various mycoses, discussions pertaining to immunity and sensitization to the fungi, as well as sections devoted to their microscopic and cultural characteristics. The book is printed on high grade paper, the type is unusually good, and the numerous photographs are excellent. In my opinion, it is a worthwhile text and can be highly recommended.—CARL W. LAYMON, M.D.

ACCEPTED FOODS, AND THEIR NUTRITIONAL SIGNIFICANCE, a publication of the Council on Foods of the American Medical Association. Cloth, Price, \$2.00 postpaid. Pp. 512. Chicago: American Medical Association, 1939.

Accepted Foods, and Their Nutritional Significance contains descriptions and detailed information regarding the chemical composition of more than 3,800 accepted products, together with a discussion of the nutritional significance of each class of foods. The book provides also the Council's opinion on many topics in nutrition, dietetics and the proper advertising of foods.

This book will be a welcome reference book for all persons interested in securing authoritative information about foods, especially the processed and fabricated foods which are widely advertised. The accepted products are classified in various categories; fats and oils; fruit juices including tomato juice; canned and dried fruit products; grain products; preparations used in the feeding of infants; meats, fish and sea foods; milk and milk products other than butter; foods for special dietetic purposes; sugars and syrups; vegetables and mushrooms; and unclassified and miscellaneous foods, including gelatin, iodized salt, coffee, tea, chocolate, cocoa, chocolate flavored beverage bases, flavoring extracts, dessert products, baking powder, cream of tartar, baking soda, cottonseed flour. There is a suitable subject index as well as an index of all the manufacturers and distributors of food products that stand accepted by the Council on Foods.

Accepted Foods is indispensable for the library of every physician concerned with foods and nutrition.

ENDOCRINE GYNECOLOGY. E. C. Hamblen, B.S., M.D., F.A.C.S. 453 pages. Illus. \$4.95. Springfield, Ill.: Charles C. Thomas, 1939

Dr. Collip, in his foreword, pays Dr. Hamblen a very deserving thank you for his admirable handling of this work prepared for the general practitioner.

The author's preface states his original purpose in collecting the material presented in his monograph was the organization of a series of lectures on endocrine gynecology for his classes of medical students, but their kind reception of his efforts prompted the preparation of these lectures for publication.

The author's expressed hope that the physician doing general practice, who does not have the time to review the various reports on endocrine subjects as they appear in the many diverse journals and yet who is interested keenly in the endocrine physiology and pathology of women, will find this volume helpful has been magnificently granted.

The pharmacology and chemistry sections of the sex-endocrine principles will be welcome to the reader. The illustrative material, hand drawn and otherwise presented, is truly a work of art.

You will all welcome this first edition, so characteristic of the Charles C. Thomas books and of Duke University School of Medicine productions. It is the expressed wish of the reviewer that the author will present revisions as often as new material is timely. The book is a treasury of references and a storehouse of

information, clearly and understandingly presented for the general practitioner, gynecologist and pediatrician.—LILLIAN L. NYE, M.D.

VARICOSE VEINS, Alton M. Ochsner, M.D., and Howard Mahorner, M.D. 147 pp. Illus. Price, \$3.00. St. Louis: C. V. Mosby Company, 1939.

This book although of only 147 pages, including the references and index, is of nice width and breadth, measuring 7x10 inches. It is well bound, and the printing and the illustrations are excellent.

The book is dedicated to Rudolph Matas and the Foreword is written by Doctor Matas. It is made up of ten chapters, including the history, anatomy, pathology, physiology, etiology, clinical aspects, examination of the varicose vein patient, the treatment, and the final chapter devoted to treatment of varicose ulcers.

The history of the treatment of varicose veins is well written and is interesting. The chapters on anatomy, pathology, physiology and etiology are what one might expect. The chapter on the examination of the varicose vein patient consists largely of the various tests for evaluating the circulation in the venous system of the lower extremities. The comparative tourniquet test devised by the authors is particularly stressed. Under the chapter entitled "Treatment," the injection treatment and the operative treatment are fully de-

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

scribed, especially the latter, which to my mind is the most important.

Altogether the book is a very desirable one to have for any one interested particularly in this subject.

M. G. GILLESPIE, M.D.

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1938. Cloth. Price, \$1.00. Pp. 120. Chicago: American Medical Association, 1939.

This volume as usual contains noteworthy examples of the various kinds of reports made by the Council on Pharmacy and Chemistry: (1) preliminary reports; (2) supplemental reports on therapeutic or pharmacologic problems; (3) reports on the rejection of preparations offered for the Council's consideration.

Among the preliminary reports in this volume that on Sulfapyridine, which carries a special article by Dr. A. Perrin H. Long, a Council member who has been much concerned with the work on this drug, is perhaps of greatest interest. After the Food and Drug Administration had released the drug for the use of physicians early in 1939, the Council accepted various brands for inclusion in N.N.R. and in connection with the published descriptions issued another status report (J.A.M.A. 112:1830, May 6, 1939) based on a questionnaire sent to men who had been prominent in the experimental use of the drug. This report, no doubt, will appear in the next volume of reprinted Council reports. Other preliminary reports are the following: Allantoin, a preparation of glyoxyldiureid purposed to supersede the use of surgical maggots; and Sulfapyridine, published shortly before the Council acceptance of this new chemotherapeutic drug.

Among the supplemental (or status) reports are those on Colloidal Sulfur in the Treatment of Chronic Arthritis, showing that much confirmatory evidence is needed to establish the value of this therapy; on Ergonovine, a careful study of the relation of this newly discovered principle to ergot therapy in general; and on PicROTOXIN in Poisoning by the Barbiturates, showing the promise and the present limitations of this antidotal therapy.

Among the reports of rejection the following are noteworthy: Collodaurum, a "colloidal gold" preparation, promoted with unwarranted, exaggerated and misleading claims for its use in the treatment of cancer; Dermo-G, stated to be a mixture of Spermaceti, White Wax, Oil of Sweet Almonds, Sodium Borate, Precipitated Sulphur and Water, an unscientific and superfluous mixture marketed under a therapeutically suggestive name with exaggerated, unwarranted claims; Fru-T-Lax, a needlessly complex and unscientific mixture advertised to the public under a misleading and inadequately descriptive name with claims which are unwarranted; and Hyposols Sulisocol, claimed to be

"Sulphur Colloid" in 2 cc. of "Autoisotonized Solution," exploited for use in arthritis with inadequate evidence to its therapeutic value. Other rejections are explained in the reports on Map and Myoston, Nupercainal—"Ciba," Pulvoids Sulfanilamide and Sodium bicarbonate (The Drug Products Co., Inc.), Quinoliv, Sedormid, and Tri-Costivin.

TEXTBOOK OF NERVOUS DISEASES. Robert Bing, Professor of Neurology, University of Basel, Switzerland. Translated by Webb Haymaker, Asst. Clinical Professor of Neurology, University of California. 838 pages. Illus. Price, \$10.00. St. Louis: C. V. Mosby Co., 1939.

After an examination of this book, the reviewer is much impressed by the imposing structure of modern neurology which is here set forth. The author succeeds admirably in condensing a massive amount of material, and his attempt "at the exposition and interpretation of facts rather than of devious hypotheses," a feat briefly and modestly indicated in his foreword to the American Edition, will indeed "be found profitable." The latest advances in neurology in Europe and America are clearly and concisely presented; where there is more than one opinion on important matters, the conflicting opinions are presented with sufficient collateral evidence to enable the reader to form an intelligent judgment. The style is lucid and there is never any doubt as to what the author intended the reader to understand. This book should be of great value to the medical student as as source of information for his daily studies, and to the busy doctor as a convenient, concise and complete reference for aid in the solution of his clinical problems.

BENJ. F. DAVIS, M.D.

A TOPOGRAPHIC ATLAS FOR X-RAY THERAPY. Ira I. Kaplan, B.S., M.D., and Sidney Rubinfeld, B.S., M.D. Price \$4.00. Chicago: Year Book Publishers, Inc., 1939.

The authors have provided the profession with an atlas which is most practical in its application. It is their answer to the general lack of precise knowledge as to the proper setting of patients for the administration of x-ray therapy. There are fifty-five full page plates showing the anatomy of the internal organs from the head down through the perineum. Since a correct knowledge of anatomy is needed in proper treatment, the location of the organs of the body was arrived at by using an average based on data obtained from standard works on anatomy and from clinical, surgical and autopsy material. Each plate shows the visible anatomic landmarks, palpable internal landmarks, the internal parts to be irradiated, and the exact placement of the treatment cone.

This atlas is a valuable adjunct to those practicing x-ray therapy. It is most handy and useful as a reference and guide to proper localization of the x-ray beam. It is not intended to supplant the more extensive books which deal with cross section and topographic anatomy.

OSCAR LIPSCHULTZ, M.D.

MINNESOTA MEDICINE

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SOME OBSERVATIONS ON BOEHLER'S TREATMENT OF FRACTURES*

B. S. ADAMS, M.D.

Hibbing, Minnesota

A YEAR and a half ago, I spent a month in Vienna, going there chiefly to observe the traumatic work of Professor Lorenz Boehler. I was especially interested in his methods of treating fractures of the vertebræ.

All of Boehler's work on fractures is based on his three cardinal principles: reduction, immobilization, and exercise of all joints not immobilized. Some have criticised Boehler for being over methodical, for using exactly the same treatment in every fracture, for not considering the differences in build, temperament, severity of injury, or any of the numerous other factors pertaining to the particular case, contending that he is working with a people so different from ours that the methods used by him would never do in this country. Boehler is a very systematic man. He has worked out a definite method for every kind of fracture and follows that quite closely; even the number of plaster bandages for each fracture is definitely in his plans. And he does follow his own method quite closely because he has found by much experience that his methods do work and that he gets good results with them. But if there are objections in any particular case to his usual method he will change to meet conditions as they exist, and when he finds that his usual method or plan can be improved he accepts the new. If a certain method is found to be giving unsatisfactory results he studies and ponders the problem until he devises a better plan. Boehler has a keen mind and a studious temperament and seems to be constantly watching his results, ever watchful for something better if what he is already using is

not giving the results he wants. In his work, Boehler is rather conservative, is usually deliberate, yet when occasion demands, he can operate rapidly and very skillfully. He does not seem to hurry but every movement seems planned and for some definite purpose; the same is true in his talking. Boehler speaks beautiful English, never using a needless word, but always choosing words that are very expressive and which definitely convey the idea he wishes to express. He is very kind to his patients and they seem fairly to worship him. He has the respect of his assistants; and the nurses and orderlies seem to have the highest regard for him. Yet he can be quite sharp and sarcastic at times.

When operating he does not remove his ordinary trousers or his white shirt that he always wears; he scrubs for operations very carefully, wears a face mask but no cap (he is entirely bald); he wears a sterile gown and rubber gloves and is meticulously careful in his technic; he always has a group of visiting surgeons around his table as closely as they can crowd and he seems to take pride in this, saying that he has never had any infection from this cause, rather deriding some Parisian and other centers where visitors have to watch from outside a windowed partition. Boehler does not believe in chemical disinfectants, very seldom uses iodine or other chemicals except soap and water, benzine and perhaps ether. His assistants often use iodine but quite sparingly; merthiolate and other disinfectants are too expensive for European clinics. He says he seldom has any infections following his operations, and I did not see any while I was there. In closing his wounds he

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almost always introduces, through a separate incision, a rubber drain tube which he removes in twenty-four hours. He is, however, very careful to stop all bleeding before closing an incision, as he says most wound infections are due to bleeding. In compound fractures, he says the skin wound is much more important than the bone injury. All wounds from injuries, trivial or severe, are thoroughly debrided, sutured with silk, and a rubber drain inserted, and complete rest required. For infections, his treatment is rest and elevation. He does not believe heat is of any particular value and seldom uses heat.

Three Cardinal Principles

Let us consider his three cardinal principles:

Reduction.—Boehler holds that the most important factor in reduction is to obtain good alignment without rotation. Alignment must be as perfect as possible and if 5 per cent or more out of alignment the bone is not reduced. He judges alignment by the center of the shaft. The fracture should be end to end, need not be exactly fitting, and if offset, it is of minor importance, but the alignment must be perfect. Shortening must be reduced to the minimum, and not over 1 cm. is allowable. Good alignment, end-to-end position, no angulation or rotation, and no shortening make for good reduction.

Immobilization.—Boehler says that complete uninterrupted immobilization from the time the bone is reduced until strong bone union takes place is absolutely necessary. Failure to accomplish this causes non-union. He favors immobilizing the bone too long rather than for too short a time. He does not believe immobilization of a joint results in a stiff joint; rather he believes motion started too early in a fracture involving a joint causes stiffness. He wants immobilization until the bone is strongly united whether it takes eight or ten weeks, or, for example in a leg, four or five months. About the only exceptions to this are in fractures of the upper humerus without displacement, shoulder and humeral fractures in old people, and motion of the arm in clavicle fractures. Except when in bed with traction he uses plaster of Paris almost exclusively for immobilizing. I saw no crutches and no wooden or artificial splints.

Airplane splints, made by his assistants, are

commonly used for fractures of the arm and for all upper arm cases. He prefers these made in his own hospital by his assistants because they fit more snugly into the axilla. Possibly expense is another factor. In many of his upper arm fractures, he uses plaster with the airplane plus traction.

Exercise.—Exercise of all joints not fixed in plaster is a very important procedure in the Boehler clinic. This means vigorous exercise regularly and frequently done—fifty times a day or more. A visit to his out-patient department as well as watching his patients in the hospital, shows a well laid-out system carried out thoroughly and systematically.

Methods of Treatment

To tell all my observations in a short paper such as this would be impossible. I wish to bring out a few of the high-lights of his methods, especially the things that impressed me most, and go into some detail regarding his treatment of back fractures.

Anesthesia.—Local injection of 2 per cent novocaine still seems to be his favorite anesthetic for most fractures. In some cases it seemed to work beautifully, but in his Colles' fractures the patients appeared to suffer a good deal of pain. He used spinal anesthesia in reducing the os calcis but local in all others that I observed. For more extensive operations, as an old fracture involving much joint dissection, ether was used.

Colles' Fracture.—Reduction is effected by a long strap attached to a hook on the wall, looped around the upper arm just above the elbow for countertraction. His assistant grasps the patient's thumb with one hand, and the second, third, and fourth fingers with his other hand. The fifth finger is not included because it might cause bowing of the hand. Strong traction is continued for at least five minutes. Then he makes very strong flexion of the wrist often until the fingers touch the forearm. Strong pressure is maintained over the dorsum at the fracture site, the hand is kept flat, and a molded plaster of Paris splint is applied along the dorsum of the hand and forearm from the base of the fingers to just above the elbow and lying more to the

radial side and molded carefully. A wet gauze bandage is wrapped around this; next a film is taken. If reduction is satisfactory the wet bandage is removed lest shrinkage cause pressure, and a dry gauze bandage is applied. Next day a volar plaster bandage is applied from a little above the finger base to elbow and a circular plaster bandage is applied allowing free motion of elbow and fingers. Anesthesia is local. Splinting is maintained for four weeks. In Colles' fractures he measures the length as well as the angle, watches alignment, and makes certain that wrist motion is free before applying the cast. Fractures of the forearm are reduced in a similar manner, also making dorsal pressure on the distal fragment with volar pressure proximally, pressing until it feels as though over-corrected. A plaster molded splint is applied from the top of the shoulder along the upper arm and down the dorsum of forearm on the radial side. A volar splint is then applied from the thumb to the elbow, the elbow being flexed to a right angle, the forearm being placed in midposition unless the fracture is in the upper third of the radius when it is supinated. Two small rods are then placed against the plaster to help keep the two bones separate—the dorsal rod being just above the wrist and the volar higher. A circular plaster bandage is then applied from thumb to axilla. The cast is retained for eight weeks. If the fracture is badly displaced he may use two Steinman pins, the upper being placed through the olecranon process and the cast, the lower pin through the bones of the wrist or of the metacarpals and through the cast. In all fractures of the forearm, it is placed in midposition except in those of the upper third of the radius, in which it is held in supination. Fractures of the head of the radius are fixed in plaster for three weeks unless badly displaced, in which case the head is removed. An olecranon, if not displaced, is fixed in flexion for three weeks; if displaced, he uses wire and fixes in flexion.

Upper Arm Fractures.—For all humerus fractures except those of the head of the bone in old people he uses an airplane splint made of Cramer wire. With this he uses a plaster molded splint on the outer surface of the upper arm carried around the elbow and down the forearm. A volar plaster splint to the elbow is added if necessary. If the fracture is hard to correct,

he uses screw traction to reduce, applies plaster splints and maintains traction by a traction rod on the end of the airplane splint. The airplane must fit snugly into the axilla to avoid angulation of the fracture. He uses starch bandages to hold the airplane in place and sews all bandages and straps securely. For fractures of the head of the humerus with no displacement he uses no retention apparatus and allows free motion in a sling after three days.

Ankle and Leg Fractures.—All ankle fractures having no displacement are put in plaster immediately. In applying the cast, the patient is seated on a table with the leg flexed at the knee and hanging over the edge of the table. The foot is supported on the doctor's knee with the foot flexed. A plaster molded splint extending from the tip of the toes on the plantar surface of the foot is carried up the back of the leg to the top of the fibula and molded carefully after cutting for heel corners. Three circular plaster bandages are used, each starting at the top and continued down to the end of the toes, but cut away on the dorsal surface to allow full dorsiflexion of toes. The cast is maintained from four to six weeks. If the fracture is severe and displaced, with rupture of lateral ligaments, the cast is kept on from ten to twelve weeks. In fractures of both malleoli with eversion (usual type) he makes very strong pressure on the lateral side of the ankle and applies a cast which must be retained for ten weeks. If the ankle is inverted, reduction must be done very early and even then results are apt to be poor. If severe, screw traction may be needed. These are serious fractures. If a small piece only two or three mm. wide is broken off the posterior surface of the tibia, no special treatment may be needed, but if a large piece such as a third of the surface is broken off, he applies screw traction on a Braun frame. Boehler says a fracture of the upper end of the fibula accompanied by a slight fracture of the posterior distal end of the tibia with a torn internal ligament makes a serious fracture and requires a plaster cast for ten weeks. These are easy to miss. Fractures of the anterior surface of the distal end of the tibia, he places in a cast with the foot in plantar flexion for six to ten weeks. Fractures of the leg above the ankle, without much displacement, are put in a plaster cast extending up the thigh

with the knee flexed slightly. If badly displaced, he uses screw traction extension, followed by a cast, using a Steinman pin through the os calcis. The leg is then placed on a Braun frame with a two-kilo weight traction for four weeks. After that he removes the pin and applies a plaster cast with a walking heel.

Femur Fractures.—Boehler's first treatment for all fractures of the femur, regardless of location, is extension by means of a two millimeter Steinman pin through the upper end of the tibia. If traction is needed longer than three weeks, as in fractures of the shaft, the pin is removed from the tibia and inserted through the lower end of the femur. His reasons are that a pin through the lower end of the femur early may infect a hematoma in the thigh, traction of the tibia longer than three weeks may loosen the knee. With traction, he places the leg on a Braun frame. For a pertrochanteric fracture, he uses pin traction for three weeks followed by skin traction using Unna paste. Later he divides the traction weight equally between the thigh and the foot; he always uses one-seventh body weight for leg extension. If coxa valga develops from extension, he lessens the weight. He uses some abduction but does not stress this. Shaft fractures are in pin traction through the upper tibia for three weeks followed by pin traction through the lower femur. The same treatment is used for fractures above the condyle. In all of these the foot of the bed is elevated, a Braun frame is fastened to the end of the bed, a box placed for the good foot to brace against, and rotation is regulated by a cord from the end of the pin to the overhead rod. No knee motion is allowed while a pin is in the bone. After the union is strong, he removes traction, uses Unna paste from toes to groin, allows knee flexion and, when sufficiently strong, allows hip motion.

Fractures of the Vertebrae.—Of all Boehler's work, his methods and treatment of broken backs seemed the most outstanding and spectacular. The results he obtains are truly marvelous, especially in some cases with marked paralysis. His patients seemed so very comfortable in spite of huge and ungainly looking casts and exercise is started so early it is hard to believe they have suffered a serious injury. At the time I was there, Boehler had twelve or thirteen broken

backs in his hospital, several coming in while I was there and others leaving. All were walking and taking vigorous exercise except one who was permanently paralyzed, and who had not come to Boehler until two weeks after his accident. It was most interesting to watch the development in these cases during the four weeks I was able to observe them; first walking very carefully and feebly, gradually increasing exercises until they were able to take very vigorous movements and carry heavy weights on their heads. Boehler claims his patients come out of their casts with a stronger and more supple back than they had before the accident. Of fifty cases, he told me all were working and without compensation except one man who was over sixty years of age. That his cases are really fractures is proven by the films.

Hyperextension in a cast is the method used by Boehler in all cases. If any lateral displacement is present this must be reduced first. He does this by strong extension, one assistant pulling on the legs and another pulling against this on the head and shoulders; then manipulation at the site of the displacement to obtain reduction. Hyperextension must be marked and extreme and the patient held in a body cast from three to nine or ten months according to the severity and amount of displacement and compression. This should be done just as soon as the patient is brought in and if any paralysis is present it must be done at once as pressure on the nerves is the cause of paralysis in most of these cases. If this pressure is not quickly released permanent nerve injury follows and paralysis will be permanent. Boehler says the only hope of these paralyzed cases is immediate reduction by hyperextension. With hyperextension he expects a good result with freedom from paralysis in most of his cases, and even in cervical fractures in 50 per cent or more of the cases. His method is to suspend the patient's trunk on a strap four inches wide for a sufficiently long time to overcome the deformity and, if a compression fracture, for the compression to unfold or widen out. This may take from one to several hours and during this time repeated lateral films are taken to watch the results. The only anesthetic used is local with morphine, and in some not even local is used. It seemed a trying procedure for the patient, tiring, though not especially painful. Then a plaster of Paris body cast is applied from

the groin to the axilla. He uses ten plaster bandages each five meters long by twenty centimeters wide. Pads of felt are applied over the iliac crests and over the point of lordosis or fracture, and a stockinette is drawn over all, no other padding being used. Trimming after setting of the plaster consists of a small opening in back at the point of the lordosis, a large opening over the abdomen, axillary openings for free motion of the arms, and similarly in the groins for free and full extension and flexion of the thighs. Pressure is necessary at three points: in front at the top of the sternum, over the pubic bones, and behind at the point of fracture—a three point pressure. In applying the cast he gets more marked hyperextension if the patient lies on his back on the strap. All fractures of the dorsal spine are placed with the patient lying on his back. Ordinary lumbar fractures may be reduced with the patient prone, but if severe or complicated he must lie on his back. If the cast is to be applied with the patient lying on his abdomen, the suspending strap is placed under the chest at the armpits; if on the back, it is placed under the site of the fracture, the best place being under the twelfth dorsal vertebra.

The procedure in reducing and immobilizing fracture of the vertebra is as follows: The patient lies prone upon a table with sandbags under the ankles and under the thighs. The legs and thighs are strapped to the table and the patient lies so that the pubes are at the end of the table when the end is dropped. A four inch wide strap (webbing) is placed under the axillæ, which have been well padded, this suspending strap being enclosed in a long cellophane envelope so it can be pulled out after cast has been applied. The suspending strap is fastened to an iron rod about two feet long and this is raised by a rope through a pulley on the ceiling. The patient is raised by this, with arms extended above his head and resting on a table that is also raised. His body is now supported by his thighs on the table and the strap under the axillæ, allowing the trunk to sag. After waiting about an hour, if lateral films show the compression to be satisfactorily reduced, the body cast is applied from axilla to groin, ten plaster bandages being used and molded very carefully and applied very evenly, special care being taken to apply this cast snugly against the upper ster-

num, against the pubic bone, and in the back against the padded fracture site. After the cast is hard and strong, the patient is let down, the suspension strap is pulled out of its cellophane envelope (this is impossible without the cellophane), the strap openings are closed with plaster bandage and the cast is trimmed to allow full arm and thigh motion. An opening is made over the abdomen, and one in the back at the point of fracture. The patient is encouraged to get out of bed the next day and to start walking at once, or at least in a few days. Most of Boehler's patients were taking very vigorous bending exercises in less than a month. The procedure when the patient lies on his back is similar, the cellophane-enveloped strap being located under the site of the fracture.

Fractures of the Upper Dorsal and Cervical Vertebrae.—Extension is required in addition to hyperextension. The patient is put in hyperextension lying on his back with strap in the axillæ. A Gleason head strap is attached. One assistant does nothing but hold the head. A scale is attached to the arch holding the head with a pull of from 15 to 30 kilos, and the extension is made a little downward as well as longitudinally. The cast is applied, extending in fractures of the dorsal spine to the pubes. The cast for fracture of the cervical spine should extend to the lower end of the sternum, the higher fractures requiring the cast to be extended higher on the neck and head. A cervical spine fracture requires the extension of the cast up the neck onto the back of the head and up onto the chin with the head and neck hyperextended, the face being directed toward the ceiling.

In cases with paralysis, it is very important to reduce vertebral fractures immediately. Many cases of paralysis are due to pressure on the intervertebral nerves and not to the accident itself. In these, if reduction is done within a few hours, recovery will be complete, but if left and not reduced early, nerve injury will follow in a very short time from pressure on the nerves and the damage will be permanent.

Boehler starts his patients walking after fractures of the vertebrae as soon as possible. If there is no paralysis this is instituted in one to three days. Exercises are increased as rapidly as possible. Most patients take vigorous exer-

cises in about three weeks, such as bending, standing on one leg and swinging the other, full arm motions, and carrying weights on the head. In from two to three months, his patients are carrying from 30 to 40 kilo on their heads. One of Boehler's favorite exercises is for his patients when convalescing, but while still in casts in the hospital, to lie across the bed with the trunk and

cast part extending beyond the edge of the bed while the assistant holds the feet down on the bed. They then raise and lower the upper end of the body, which is extended beyond the bed, as fully as possible. This exercise is repeated daily. Boehler says his patients recover with a back stronger and more limber than it was before the accident.

TUMORS OF THE NEUROMYO-ARTERIAL GLOMUS*

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GLOMUS tumors are of extreme interest because, notwithstanding their small and insignificant size, they are able to produce severe pain and agony to the afflicted patient. These growths vary from a pin head to hazel nut in size and are a benign hypertrophy of existing arterial-venous anastomoses. As these anastomoses are more frequent on the extremities, especially the fingers, and nail beds, the tumors are therefore more prevalent in these areas. They appear as slight bluish-red elevations on the skin and the most diagnostic feature is the agonizing pain which the patient feels on the slightest pressure. When these growths are subungual, they are not always visible. The diagnosis can only be made by the extreme pain manifested by pressure on the nail. Occasionally a slight bluish discoloration may be noticed under the nail, or if the tumor has been present for a sufficient time a roentgenogram of the finger may show some erosion of the phalanx. It is my purpose in this paper to describe two typical cases of this condition, and briefly review the normal physiology and histology of these tumors.

A Review of the Literature

There have been so many excellent reviews of this subject published in the American literature during the past few years that it is superfluous to give a detailed discussion. These peculiar tumors have been described by numerous authors³ during the past fifty years under various names

such as "angiosarcoma," and "painful subcutaneous tubercles." It remained, however, for Barré² to clearly outline the clinical manifestations and to establish that surgical excision was curative. These specimens were studied by Masson,⁹ who described their histologic characteristics and also showed that they were benign overgrowths of an arteriovenous anastomosis which are present normally in the stratum reticulare of the cutis. Recent reviews of this subject and reports of cases have been made by Bailey,¹ Freudenthal,⁴ Stout,¹² and Lewis and Geschickter.⁷ Radasch¹¹ in a recent review of the literature was able to find reports of ninety cases, four of which were instances of multiple tumors.

Normal Histology and Physiology

It was Masson who first proved that the glomus exists normally in the subcutaneous tissue and that glomal tumors result from hypertrophy. Sucquet¹³ first described arterio-venous shunts which he found by making special injections into arteries of material which he noticed went directly into the veins without entering any capillaries. Later Hoyer⁵ described and demonstrated similar anastomoses in animals. Popoff¹⁰ has recently made an extensive study of these vascular anastomoses both in normal and pathological conditions. He found that they were more numerous in the nail beds, tips of fingers, palms and soles than any other part of the body.

A glomus consists of various parts, first the afferent arteriole, which is a small branch of the subcutaneous artery. This arteriole gives off sev-

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eral smaller branches which supply nutrition to the reticular and supporting tissue of the glomus. The arteriole then leads directly into the anastomotic vessel (Sucquet-Hoyer canal), which now becomes considerably modified (Figs. 1 and

consisting of delicate collagenous fibres and peripheral to this is a denser lamellated collagenous tissue which forms an irregular capsule around the glomus and it is in the meshes of this tissue that the collecting veins are found.

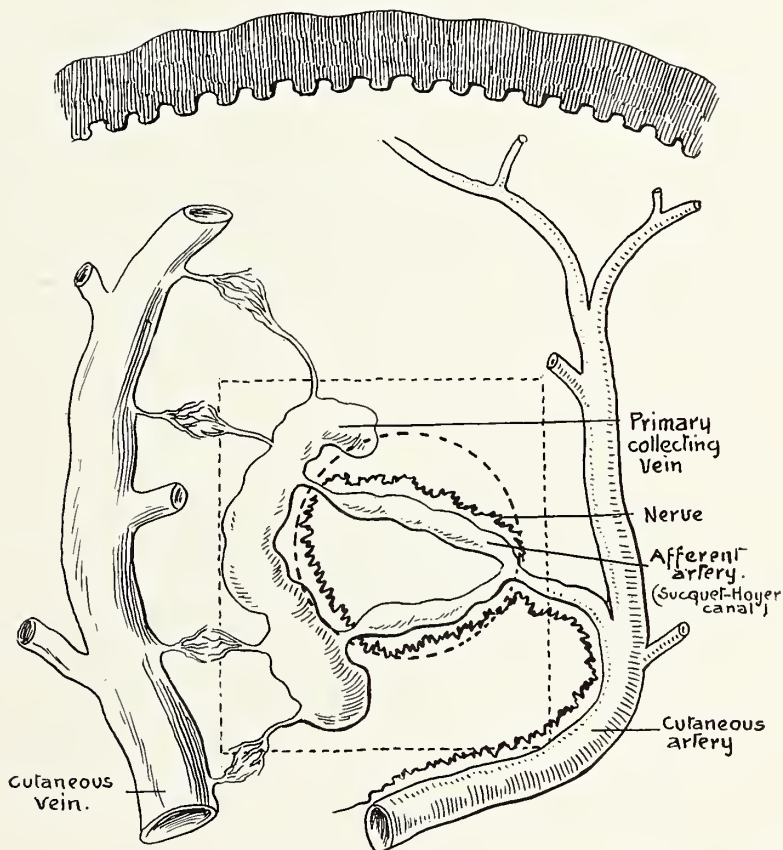


Fig. 1. Schema of normal glomus. The portion in the dotted square is the glomus proper and the portion in the dotted circle is enlarged in Figure 2. Reproduced by courtesy of Doctors Fred Weidman and Fred Wise.

2). Its course is very tortuous or "S"-shaped; the endothelial cells are cuboidal, increased in size, and two or three rows thick. The internal elastic lamina is lost and the muscular coat consists of an indistinct inner longitudinal and outer circular layer. Amid the muscle cells are large clear epitheloid cells or so-called glomus cells. The outer zone consists of a loose collagenous reticulum, in the meshes of which are found numerous non-medullated nerves. Around the canals like a plexus are the collecting veins into which they empty; these veins are thin walled and poor in muscular tissue. They in turn empty into subcapillary venous plexus and thence into the deeper veins. Around the vessels is an area

Popoff found the glomus entirely lacking at birth but that it begins to develop rapidly post-natally, undergoing atrophy around sixty years of age. The anastomoses act both locally and generally in the regulation of heat. If a local area is cold, the glomus diverts blood from the capillaries to its collecting veins, which have a large surface area. Generally they may aid in conserving or lowering the body heat as above. When the body temperature is elevated the glomus rushes blood to the surface veins for cooling and when the body temperature is low it diverts the blood from the surface to conserve its heat. The glomus also aids in regulating the flow of blood through an extremity by either allow-

ing it to fill the capillary bed or by diverting it into the collecting veins, where it is rapidly placed back in the general circulation. Since the glomus is absent in the premature baby, it is rather convincing evidence that it is probably a great factor

give origin to the smooth muscle elements of the glomus; others think they are angioblasts giving rise to blood vessels of the growth. Stout was able to demonstrate, in his histologic sections, areas around blood vessels where the glomus

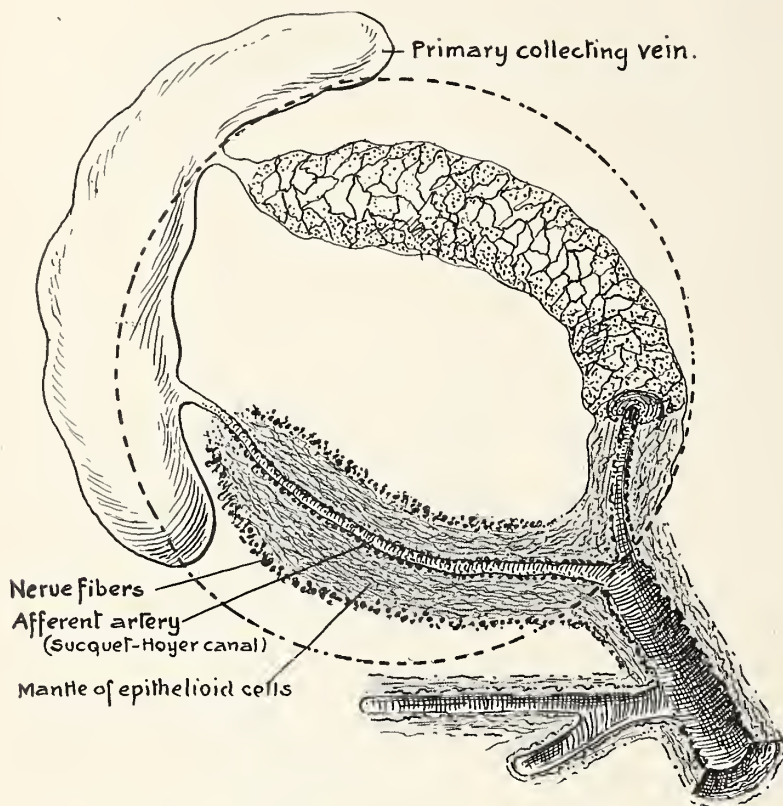


Fig. 2. Enlarged portion of the glomus illustrated in Figure 1.

in controlling local and body heat. Masson believed that the glomus aided in tactile sense by its ability to regulate vascular pressures and thereby interstitial pressures. He believed that was the reason why they were so plentiful in the areas in which the tactile sense was best developed, namely the finger tips. Popoff also found that the normal glomus was increased in number in arteriosclerosis and in extremities in which gangrene associated with diabetes was developing.

The glomal tumor represents a benign hyperplasia of all of the elements contained in the normal glomus, especially the so-called epithelioid cells. These cells are peculiar and closely resemble the cells of the glomus coccygeum.¹² They are undoubtedly mesoblastic in origin. Some authors believe they are myoblasts and

cells were transforming into smooth muscle cells.

Mason and Weil⁸ found that the distribution of the tumors as to sex was about equal and that they occurred from eight to eighty-two years of age. In reviewing thirty-four cases they found twenty-one were on the upper extremities and two-thirds of these were subungual. The lesions are also more frequent among Jews, who are more prone to develop disturbances of the sympathetic innervation of the extremities.

Report of Cases

Case 1.—Mrs. L. T., a forty-five-year-old white woman of Scandinavian descent, consulted the University Hospital Staff because of recurrent attacks of upper right quadrant pain which was interpreted by the Surgical Department as cholelithiasis. She was seen in consultation by the Dermatology Staff because of a

painful tumor on the right forearm that had been present for ten years or more. With the slightest touch or exposure to cold air she would feel paroxysms of severe pain which would shoot up and down her arm.

these patients on the slightest pressure, or even changes in temperature, special studies were performed to demonstrate nerve fibers. At the suggestion of Dr. A. T. Rasmussen one half of the tissue which was removed from the first patient was fixed in absolute alcohol, to

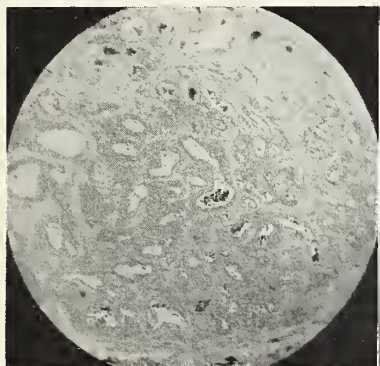


Fig. 3. Section of glomus tumor under low power magnification showing numerous vascular spaces which are surrounded by a mantle of epithelioid-like cells.

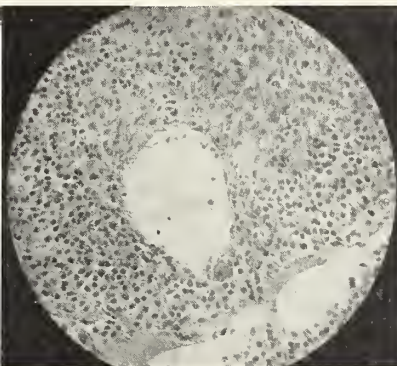


Figure 4. High power magnification of one of the vascular spaces as shown in Figure 3. The lining endothelium may be seen and the epithelioid (glomus) cells in detail.

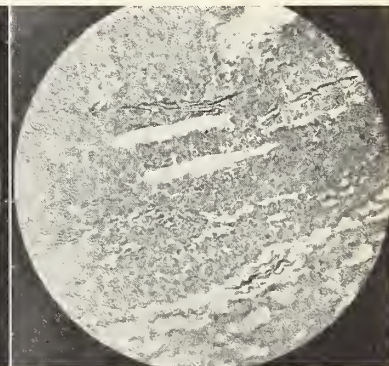


Fig. 5. High power magnification of area similar to Figure 4, showing nerve fibers among glomus cells and in supporting tissue.

Examination of her skin revealed a semi-solid bluish red tumor about the size of the head of a lead pencil located on the dorsal surface of the right forearm. With the slightest pressure on the lesion, the patient experienced excruciating pain. The lesion was completely excised under local anesthesia. The tumor was divided in half, one portion being fixed in 70 per cent alcohol, then blocked in paraffin, sectioned and stained with hematoxylin and eosin.

Microscopic examination under low power objective showed the tumor to be encapsulated by connective tissue. The central portion consisted of numerous vascular spaces, lined by large cuboidal endothelial cells (Figs. 3 and 4). Next to these were large polyhedral cells with an acidophilic cytoplasm and a dark staining nucleus. These cells varied in thickness from three to four around some blood channels to ten or twelve around others, and are those described as epithelioid or glomus cells. Interspersed between and among the cells were collagenous fibers as a supportive structure. The diagnosis of the histologic section was that of a "glomus tumor."

Case 2.—Mr. A. M., fifty-eight years of age, consulted Dr. L. A. Whitesell because of a small painful growth on the medial aspect of the left knee. The growth was so painful that he devised a protective bunion pad to remove garment pressure.

Examination of his skin showed a small slightly elevated bluish red nodule measuring two by three centimeters, located over the medial aspect of the head of the left tibia. The tumor mass was completely excised under local novocaine infiltration anesthesia. Histologic examination of the tumor tissue was similar to that described in Case 1 and the diagnosis was "glomus tumor."

Because of the excruciating pain that is elicited by

which six drops of ammonium hydrate per 100 c.c. were added. The tissue was stained by Cajal pyridine silver stain of Dr. Larsell⁶ and then imbedded in paraffin and sectioned. Microscopic examination of this tissue after staining by this special technic showed numerous nerve fibers entering through the capsule and spreading out into the reticular tissue, where they seemed to terminate about the glomus cell (Fig. 5).

Comment

The two cases reported are typical of an unusual neurovascular tumor which has created intense interest in the literature of recent years. These lesions are clinically very important, primarily because of the excruciating pain which they produce. The frequent occurrence of these growths below the finger nails makes the diagnosis less obvious, but careful examination will usually show discoloration of the nail in a small area and occasionally erosion of the terminal phalanx may be seen on roentgen examination. A rich supply of nerve fibers terminates about the epithelioid-like cells that are present around the vascular spaces. It would seem apparent then that changes in tension within the vascular spaces would account for the severe pain that occurs in these tumors. The lesions are cured by simple surgical excision and do not respond to any type of radiation therapy. Histologic examination will readily confirm the diagnosis. In approximately a hundred cases now reported in the

literature, no evidence of malignancy has been found.

Summary

Two typical cases of glomus tumors have been described. The histology and physiology of these benign growths have been discussed, especially the rich supply of nerve fibers which apparently innervates the vascular spaces. These nerves probably account for the characteristic pain present on the slightest manipulation. Surgical excision is usually curative.

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PERIODIC HYPERMOMNIA, HYPERPYREXIA, AND HUNGER, SECONDARY TO EPIDEMIC ENCEPHALITIS*

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FULTON⁸ in his recent textbook, "Physiology of the Nervous System," states that five distinct syndromes of the hypothalamus can be recognized. In some instances these syndromes may occur fairly well isolated; in others evidence of the entire group may manifest itself, depending on the location and extent of the lesion and the rapidity of its development. These syndromes may be designated as (1) hyperthermia, (2) diabetes insipidus and emaciation, (3) the adiposogenital syndrome, (4) hypersomnia with disturbed thermal regulation, and (5) autonomic epilepsy.

In association with these syndromes, personality changes and other psychic manifestations may present themselves, varying from simple depression to any of the major psychoses. Periods of excitement tend to develop from lesions of the anterior hypothalamus, while depressed¹³ lethargic, and even catatonic states may be produced by posterior lesions.

Many cases of hyperthermia and hypothermia associated with lesions in the hypothalamus are recorded in the literature. The combination of hypersomnia with hyperthermia occurring at irregular but quite frequent intervals over a period of over four years, with periods of hunger,

is of sufficient interest to warrant this report. Although no pathologic studies are available at the present time, the clinical manifestations are quite typical of a hypothalamic syndrome.

Report of Case

Attack of epidemic encephalitis: aphasia for two years; recurrent attacks of hypersomnia and hyperthermia developing soon after encephalitis; periods of persistent hunger.

The patient, a boy four years and nine months of age, was referred to us by Dr. E. J. Fogelberg on December 8, 1937. (Now aged five years, six months.)

Family history was negative except that the father had migraine for many years.

The patient was a cesarean section delivery at eight and a half months. He developed normally, walked at ten months, and was able to talk some at the time of the onset of the encephalitis at the age of sixteen months. During his first year he had chicken-pox and measles without any complications. He is right-handed. At sixteen months of age, in July, 1934, he developed encephalitis, with two generalized convulsions during the first twenty-four hours. His temperature varied between 100 and 105 degrees F. Following the convulsions he apparently slept for about twenty hours. He gradually recovered but remained aphasic until the winter of 1936, when he began to say a few words. His vocabulary gradually increased and his speech is quite normal at present. During the entire period his vesical functions were normal. He expressed his wants by pointing to what he desired.

About one month after he recovered from his en-

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cephalitis, in August, 1934, he would have attacks of gradually becoming sleepy, and after a short period would fall into what appeared a deep normal sleep. He would sleep from twenty-four to seventy-two hours, then awaken, would dress himself, appear normal, and go out and play with other children. During these attacks of hypersomnia he could be aroused, would take a little food and again fall asleep while eating. There have been no involuntaries. On several occasions he would awaken, urinate, and be asleep before he had completely emptied his bladder. During the attack he lies quietly and relaxed, except on five occasions, when his right arm was restless and he would move it about, but there were no convulsive jerkings. He has slept continuously for forty-eight hours without taking food or drink, or urinating.

He may have prodromal symptoms, such as an occasional occipital headache or a feeling of drowsiness for about fifteen minutes before falling asleep. He realizes that an attack is coming on and does his utmost to keep awake. Before an attack he frequently tells his mother, "I am so sleepy I cannot stay awake," and then begs her repeatedly to remain with him if he should fall asleep. He sits down, is very quiet, and within a few minutes is sound asleep. These attacks occur at irregular intervals, averaging about two a month. He has fallen asleep on the railroad track, on the highway, in the field, on the playground, and at home. The mother estimates that he has had over one hundred of these during the past four years. His last attack occurred on August 21, 1938, was of fifty hours' duration, and was accompanied by a hyperthermia of 104 degrees F.

His temperature, which has been noted daily for over three years, has been normal except during the periods of hypersomnia. About one-half hour before the hypersomnia manifested itself he would develop a temperature of about 100 degrees F. From three to four hours after he has fallen asleep the temperature would reach its maximum, 103 to 105 degrees. It would continue at this level until he began to awaken and then rapidly return to normal. Cold water enemas and cold baths would reduce the temperature about two degrees, without any appreciable effect on the hypersomnia. His pulse averaged about 130 and respirations 26 per minute during the attack. They were not accompanied by sweating or any evidence of vasomotor reactions. The attacks of hypersomnia and hyperthermia always accompanied each other and have never occurred separately. They have continued since the onset without any special variation in their frequency or severity.

During the past year, since September, 1937, he has had periods of about twelve hours' duration during which time he would continuously beg for food. The mother stated that he has had about twenty of these attacks. She describes them as "mental hunger." He would eat a good meal and within a few minutes insist that he was so hungry and wanted food. When the food was given to him, he refused to eat because he said that he felt so "full." Within a short interval

he would repeat the same request. This would continue during the entire day until he finally fell asleep. Upon awakening the following morning his food hunger had disappeared. The last one occurred seven days ago. During these periods his food and fluid intake were normal. These attacks bore no relation to the hypersomnia and hyperthermia, and never occurred during or immediately before or after the hypersomnia.

His urinary output has been normal. There has been no evidence of polyuria or polydipsia. He has not manifested any personality changes or temper tantrums. He plays normally with his toys and with other children and is anxious to begin school. He has an occasional period when his memory seems slightly impaired, but the greater part of the time he is alert and remembers well. His nocturnal sleep is normal. He has had no petit mal attacks or convulsive seizures since the encephalitis.

Physical examination reveals a well nourished, well developed male, weighing 48 pounds. Complete examination, including the sexual organs, showed no abnormality.

The neurological examination was also negative throughout. Pupils, fundi, eye movements, other cranial nerves, reflexes, sensation, and so forth, were negative. Mentally he was alert, answered questions fairly well and executed the various tests promptly and correctly. His memory was normal.

His temperature was 98.6 degrees F., pulse 84, taken at 3 p. m. yesterday; hemoglobin 82 per cent; red blood cells 4,700,000; leukocytes 8,400; differential count normal; blood pressure, systolic 96, diastolic 45; blood Wassermann negative. The spinal fluid on December 9, 1937, was clear and colorless, under pressure of 220 mm. of water. It contained one cell, a trace of globulin, and the Wassermann negative and the colloidal gold curve normal. The quantitative sugar and quantitative protein were within normal limits. Roentgenological studies of the skull, sella tursica, and chest were normal. No encephalograms were made. Basal metabolic rate was +2 per cent.

The sugar tolerance test gave the following values for blood sugar: after fasting, 70 mg. per 100 c.c.; one-half hour after ingestion of 100 gm. of dextrose, 98 mg; one hour, 78 mg, and two hours, 69 mg. The water balance was normal.

He had had a tonsillectomy at the age of thirty months and has been given benzedrine, without any noticeable effect on his attacks.

Masten¹² observed a somewhat similar case.

In December, 1935, a girl of seven had an attack of illness, manifested by sleepiness, headache, earache, sore throat, and abdominal pain. Within one week she complained of weakness of both legs and soon after could not stand. The acute illness continued for ten days with fever of 104.4 degrees rectally. The legs remained weak until July, 1936, when strength returned suddenly. In September, 1936, she had a period of deep sleep of twelve hours' duration, and similar at-

tacks in the fall and winter of 1937. Upon awakening she screamed and held her head. Occasionally she sobbed continuously for two or three days, her only reason given for crying being that she was tired. During these days she was very irritable. The day following her attacks of hypersomnia she ran a high temperature. She had also been manifesting some personality changes. Formerly she was an active, keen youngster. Since her illness she had become quiet, taking no part or interest in the activities of her brothers and sisters and preferring to sit and rock with a doll in her lap.

Comment

Our case is of interest because of the isolated syndromes of recurrent attacks of hypersomnia and hyperthermia, extending over a period of four years. Lethargic encephalitis frequently produces lesions in the hypothalamus. Eaves and Croll⁶ have found this region invariably involved in encephalitis, and more extensively than any other portion of the brain except the substantia nigra. Disturbances in the sleep rhythm and the presence of a sleep center in this region were described by von Economo⁵ in 1930. Later clinical and experimental evidence indicate that the posterior group of the hypothalamic nuclei, including the mamillary body and the nucleus hypothalamicus posterior, are involved. According to Hess, stimulation of this region with a faradic current induces hypersomnia. Ranson,¹⁵ however, has never been able to produce sleep by faradic stimulation of the hypothalamus, but all the reactions were those that accompany emotional excitement. Fulton and Bailey⁹ also reported cases of expanding tumors in this region associated with pathologic sleep. Bailey⁹ has further observed that manipulation of the posterior hypothalamus and central gray of the Sylvian aqueduct causes loss of consciousness, which is not so prone to occur if the anterior hypothalamus is irritated.

The importance of the hypothalamus for the regulation of body temperature has been reviewed repeatedly in the literature. Frazier, Alpers, and Levy⁷ have conclusively demonstrated that mesially placed bilateral lesions in the floor of the third ventricle in cats produce complete loss of temperature control, resulting in a sustained hypothermia. The lesion involved the floor of the third ventricle corresponding to the nucleus hypothalamicus anterior in cats and the substantia grisea in man. In no instances were

they able to produce hyperthermia by lesions placed in the hypothalamus. Alpers,¹ however, reported two cases of tumor in the pituitary area in which death was accompanied by severe hyperthermia. The lesions were found in the floor of the third ventricle, more particularly in the substantia grisea. Jacoby and Rohmer observed that severe and prolonged hyperthermia could be produced by the introduction of mercury into the ventricular system, especially into the infundibular region. Cushing in his Lister Memorial lecture stated that complete emptying of the ventricles of the brain in children has been followed by hyperthermia. Ranson and his coworkers¹⁴ in their experiments on monkeys have demonstrated that postoperative hyperthermia develops when bilateral lesions are made in the lateral part of the rostral portion of the hypothalamus. Hypothermia develops when the bilateral lesions are situated dorsolateral to the rostral part of the mammillary bodies. The hyperthermia is usually transient and of about twenty-four hours' duration, while the hypothermia may continue for days, even as long as a month.

Davidson and Selby⁴ reported a case of adiposogenital dystrophy with hypersomnia and hypothermia. During a period of over three months, the average temperature was about 92.5 degrees F. Postmortem studies revealed an angioma situated in the floor of the third ventricle. The prolonged hypothermia was evidently due to an extensive involvement of the tuber nuclei and the mammillary bodies. Davidson and Friedman³ reported the case of a twenty-nine-day old infant who during its life time manifested constant fluctuations of hypo- and hyperthermia which tended to approximate the environmental temperature. Pathologic studies revealed that most of the hypothalamic nuclei, especially the mesial group, were destroyed by an infiltrating neuroblastoma. Fulton⁸ states that in man usually both mechanisms of heat loss and heat production are disturbed because most lesions tend to involve both groups of nuclei simultaneously, due to the antero-posterior narrowing of the hypothalamic area in man.

The complaint of periods of continued hunger presents another interesting phase in our case. Beattie² and others have shown that stimulation of the mid-line nuclei in the region of the tuber evoke increased peristalsis of the stomach and

intestines, along with other phenomena, indicating a sympathetic outflow.

Levin,¹¹ under the title of "Periodic Somnolence and Morbid Hunger," reviewed ten cases from the literature, including one of his own. No pathologic findings were recorded. His hypothesis is that "periodic somnolence hunger" is due to excessive "inhibitability" or exhaustibility of the highest cerebral centers, particularly the highest motor centers. He bases this opinion on the results Fulton¹⁰ and his coworkers obtained after bilateral removal of parts of the frontal lobes in monkeys. The excision of these areas produced increased appetite, gastro-intestinal motility, and frequently intussusception. Hyperpyrexia, however, was not an accompaniment.

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CARCINOMA OF THE CERVIX UTERI: FACTORS INFLUENCING PROGNOSIS*

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IT IS generally agreed that the following factors are important in determining the prognosis in the average case of carcinoma of the uterine cervix: (1) extent of the local lesion; (2) age of the patient; (3) general health and vigor, and (4) resistance to the malignant growth. A statistical study of 1,491 cases of carcinoma of the cervix encountered in the Section on Therapeutic Radiology of The Mayo Clinic from 1915 to 1929, inclusive, furnishes some additional data. On the basis of these data, the following topics as well as the four prognostic factors already mentioned will be considered: (1) influence of sterility and fertility; (2) influence of biopsy; (3) histologic types; (4) grade of malignant change; (5) technic of treatment employed; (6) experience of the radium therapist; (7) hospital mortality, and (8) treatment of recurrent lesions.

Statistical data and clinical impressions have

definite limitations in the consideration of these topics; however, these data and clinical impressions may indicate in a measure a valuable trend or may constitute a definite lead and may indirectly assist in an attempt to formulate a worthwhile opinion. Some of the topics do not lend themselves at all to a statistical analysis. It is impossible to arrange these topics according to their importance as there are many factors which influence the choice or selection.

Extent of the Local Lesion

The extent or stage of the primary lesion and the extent or stage of the secondary lesions always have been and are today of major importance to the physician in deciding whether or not the patient has a chance for cure or palliation. A suitable classification is essential for proper interpretation of the immediate and late results. The extent of the primary and secondary lesions is the basis of the following classification: Stage 1 denotes that the primary lesion is limited to the cervix of the uterus. Stage 2 indicates that the

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CARCINOMA OF THE CERVIX UTERI—BOWING

TABLE I. CLASSIFICATION OF CARCINOMA OF THE UTERINE CERVIX ACCORDING TO STAGE OF INVOLVEMENT IN 1,079 CASES*

Stage of involvement	Cases	Per cent
1	13	1.2
2	85	7.9
3	825	76.4
4	156	14.5
Total	1,079	100

*In 412 of the series of 1,491 cases the lesions had been modified by previous treatment.

TABLE II. RESULTS OF TREATMENT OF CARCINOMA OF THE UTERINE CERVIX BY IRRADIATION ALONE ACCORDING TO STAGE OF INVOLVEMENT

Stage of involvement	Patients treated	Patients traced	Lived five or more years after treatment	
			Patients	Per cent of those traced
1	13	13	9	69.2
2	85	78	47	60.2
3	825	753	224	29.7
4	156	138	9	6.5
Total	1,079*	982 (91.8%)	289	29.4

*Fourteen, or 1.3 per cent, of the 1,079 patients died in the hospital during the course of treatment.

primary lesion involves the cervix and has caused moderate infiltration of the vaginal wall or the parametrial tissues; in this stage the uterus is movable. Stage 3 indicates that the primary lesion has extended well beyond the cervix infiltrating the parametrium and has caused definite fixation of the uterus. Stage 4 indicates that the primary and secondary lesions have caused extensive local infiltration and involvement of pelvic structures and that there is wide fixation of the uterus with or without metastasis to distant regions.

Table I shows the stage of involvement in 1,079 cases in which the lesion had not been modified by previous treatment. The data in this table were obtained from the clinical, surgical and special records. In more than 90 per cent of the 1,079 cases, the disease was beyond any type of curative surgical intervention.

Table II shows the stage of the disease and

TABLE III. RESULTS OF TREATMENT OF CARCINOMA OF THE UTERINE CERVIX BY IRRADIATION ALONE, ACCORDING TO AGE OF THE PATIENTS

Age, years	Patients treated	Patients traced	Lived five or more years after treatment	
			Number	Percentage of traced patients
20-39	312	285	68	23.8
40-59	948	863	235	27.2
60-79	230	203	59	29.1
Total	1,490*	1,351* (90.7%)	362	26.7

*One patient, who was between eighty and ninety years of age and who lived five years after the completion of treatment, is not included in this table.

the number of patients who lived five or more years after the completion of irradiation. Although the number of cases in which the disease was classified as stage 1 or 2 is comparatively small, the data in this table seem to indicate that the stage of involvement does have a definite relationship to the prognosis.

Age of the Patient

In general, young adults or elderly persons who have carcinoma are adjudged to respond poorly to treatment and the ultimate prognosis is not good. The presence of degenerative disease frequently influences adversely the prognosis for elderly persons.

Table III shows the relation of the age of the patient to the prognosis in 1,490 of the 1,491 cases. This table does not include one patient who was between eighty and ninety years of age and who lived five years after the completion of treatment. The total number of cases were divided into three groups according to the age of the patients. The data in this table indicate that the age of the patient does not have any appreciable influence on the prognosis. Evidently, patients who receive individual radium therapy for carcinoma of the uterine cervix, regardless of age, have about an equal chance for survival for five years or more. The older age group have a slight advantage in this regard over the younger age groups.

General Health of the Patient

From the standpoint of the radiotherapist, the general health and vigor of the patient are very important. Such complications as second-

any infection and secondary anemia tend to decrease the resistance of the patient and retard the response of the patient to treatment. Patients who are vigorous and in good general health can tolerate adequate doses of radium and roentgen rays very well. In cases of advanced or extensive carcinoma in which complications have affected the general health of the patient, both local and general supportive measures are necessary and only limited radiotherapy can be employed.

The statistical data concerning the general health of the 1,491 patients are incomplete. From clinical experience we may conclude that the general health of the patients who have stage 1 and 2 lesions is good. Patients who have stage 3 lesions may show a moderate secondary anemia or patients with recent severe hemorrhage may need special consideration before treatment is started; as a rule patients who have stage 4 lesions experience comparatively a severe break in general health.

The most important consideration is the healing or absorption of the malignant lesion or lesions; in other words, the bodily reactions should be at their best in order that the malignant lesion may lose its malignant features and the affected part if possible may be restored. Usually, cervical carcinoma is secondarily infected. These two pathologic conditions, carcinoma and infection, make a simultaneous demand on the patient's health. With proper treatment and in a relatively brief period, the malignant lesion and the inflammation will respond. The local cellulitis with minimal ulceration does not require any special treatment. Pelvic cellulitis with fever has responded well to chemotherapy, sulfanilamide for example. Pelvic abscess may require surgical treatment. Infection by way of the blood stream is usually a serious complication. Co-existing pyometritis will subside after simple procedures, such as uterine drainage.

Resistance to the Malignant Growth

As yet we have no clinical or laboratory test that would definitely indicate resistance or non-resistance to the malignant growth. Clinically, there are two varieties of cervical carcinoma, the medullary type and the infiltrating or ulcerating type. Theoretically, the medullary type begins as a superficial growth in the epithelium of the portio vaginalis and proceeds to enlarge into the

vaginal cavity. Its infiltrating characteristic is a relatively minor feature. The ulcerating type probably begins within or beneath the epithelium of the lower uterine segment as a nodular growth. It infiltrates the uterus and parametrial tissues readily, and as growth proceeds it tends toward ulceration. Clinically, the medullary variety seems to grow more rapidly than the ulcerative variety. There is a possibility that the patient's resistance or lack of resistance may be reflected in the gross characteristics of these two comparatively distinct types of carcinoma. Little is known about the time element or speed of development of any malignant lesion of the uterine cervix. As a rule, the history, regardless of how carefully it is taken, cannot be relied on for determining the actual time of onset of the disease. The correlation of accumulated data seems tedious and the many variations make the problem difficult of solution. However, careful clinical studies will add to our knowledge and eventually we may be able to understand better these characteristics that we are considering. Results of radiation therapy have definitely proved that with proper treatment the patient has the power or ability to heal or restore the affected part to normal. Evidently this phase of our problem was not fully appreciated by early workers in the field of malignant disease. Naturally, therefore, everything possible should be done to support the patient in conjunction with adequate irradiation and thus assure satisfactory recovery.

The Influence of Sterility and Fertility

The etiology of carcinoma of the uterine cervix is unknown, in that there are no benign lesions of the cervix that have been proved to be always premalignant. Among the predisposing factors of cervical carcinoma, lacerations, erosions, eversion and the like are always considered of importance. Because pregnancy is the most common single cause for cervical trauma, a record of the sterility and fertility of the total group was compiled.

The civil state of the total 1,491 cases is as follows: There were 1,473 (98.8 per cent) married patients and eighteen (1.2 per cent) single patients. One or more pregnancies occurred in each of 1,320 patients, an incidence of 88.5 per cent. According to the records of 149 patients (10 per cent), pregnancy did not occur. In

twenty-two records (1.5 per cent), the incidence of gravidity was not stated. There were 4,792 pregnancies that proceeded to full term and 973 miscarriages were recorded for the entire group. Excluding the aforementioned twenty-two histories, the average number of pregnancies for the group was 3.3 pregnancies per patient.

TABLE IV. RESULTS OF TREATMENT OF CARCINOMA OF THE UTERINE CERVIX BY IRRADIATION ALONE. PERCENTAGE SURVIVAL RATES ACCORDING TO THE STERILITY OR FERTILITY RECORDED

	Patients treated	Patients traced	Lived five or more years after treatment	
			Patients	Per cent of those traced
One pregnancy	262	242	67	27.7
Two or more pregnancies*	991	896	250	27.9
No pregnancy	149	136	28	20.6
Miscarriage (only)	67	60	17	28.3
Not stated	22	18	1	5.6
Total	1,491	1,352	363	26.8

*From 2 to 15 pregnancies.

The percentage survival rates are listed in Table IV according to the data on sterility or fertility in the clinical record. Each of 991 patients experienced two or more pregnancies that proceeded to full term and 250 patients (27.7 per cent) lived five or more years after treatment. There were 262 patients who experienced one full-term pregnancy and sixty-seven of these (27.7 per cent) lived five years or more after treatment. There were 149 patients who did not experience pregnancy and of these twenty-eight (20.6 per cent) lived five or more years after treatment. Sixty-seven patients experienced miscarriage, only, and of these, seventeen patients (28.3 per cent) lived five or more years after treatment.

Evidently carcinoma of the uterine cervix is a disease of married women; however, it is infrequent among Jewish women.^{1, 4} Furthermore, the number of pregnancies did not significantly influence the prognosis or the survival rate for five years and more among those groups studied, and the lowest percentage of five-year survivals or more occurred in the group in which no pregnancies occurred.

The Influence of Biopsy

For our purpose, there are two kinds of biopsies. One may be designated a surgical biopsy and may be considered as a minor surgical procedure, whereas the other may be designated a therapeutic biopsy. The surgical biopsy usually requires administration of a general anesthetic agent which permits a more liberal bimanual palpation of the pelvic structures, especially if the patient is nervous or apprehensive. Thus, it furnishes valuable, additional information. The speculum and tenaculum are placed to afford exposure and if the lesion is only partly movable, the maintenance of adequate exposure may be very tedious. The pathologic tissue is removed by incision, which may extend into the normal tissue. As a rule, the specimen consists of a piece of tissue representative of the part and therefore most reliable for histologic study. The actual cautery may be applied to control bleeding or one or more sutures may be necessary. A gauze pack is placed in the vagina.

The therapeutic biopsy is performed at the time of the first application of radium. A general anesthetic is not necessary. The patient is placed in the knee-chest position. A speculum and some type of direct light allow for ample exposure. The entire vaginal portion of the pathologic lesion can be readily inspected and a representative site can be selected from which to remove the specimen. Trauma is reduced to a minimum in that a tenaculum is not used. A bit of tissue, the size of a grain of wheat, is removed with a tracheal biopsy instrument in the average case. The area selected is free of necrosis and may be considered as an everted surface of the malignant infiltrating lesion. The normal tissues are not disturbed. There is very little bleeding, if any. The number of positive findings on the small piece of removed tissue is very high; only occasionally may the pathologist ask for another specimen.

An ideal procedure for biopsy would be one without trauma or risk to the patient. The first procedure mentioned is definitely traumatic and there is some attendant risk, whereas the latter procedure in a measure does approach the ideal and carries very little risk, if any. Biopsy is an essential part or feature of the diagnostic procedures and should be a routine requirement in all cases selected for treatment. In selected

cases, the surgical biopsy together with dilatation and curettage, may be necessary to establish the diagnosis. Especially is this true, should the history and gross appearance of the cervical lesion be atypical; therefore everything possible should be done to establish the diagnosis of carcinoma of the uterine cervix. A failure to diagnose stage 1 or 2 lesions is a serious matter for, in the interval, the patient may pass into the third or fourth stage of the disease in which the ultimate prognosis is only fair or palliation is all that can be expected.

I am certain that the risk of a surgical biopsy and especially the very slight risk of a therapeutic biopsy is outweighed by the positive information it affords.

The Histologic Types

More than 90 per cent of malignant lesions of the uterine cervix are squamous-cell epithelioma. About 5 to 8 per cent are adenocarcinoma and the remainder are a combination of squamous-cell epithelioma and adenocarcinoma.²

The gross appearance of the lesion does not allow determination of the histologic type. Infiltrating lesions probably predominate. The medullary lesion of the portio vaginalis is usually squamous-cell epithelioma, grade 3 or 4, and is prone to necrosis, hemorrhage and secondary infection, whereas infiltrating squamous-cell epithelioma or adenocarcinoma occurring in the portio supravaginalis tends toward early infiltration and may block the cervical canal, obstructing the flow of uterine secretion and ultimately bringing about various degrees of pyometritis and pain that simulate menstrual pelvic distress. The latter complication occurs as a feature of the character and the site of the malignant lesion rather than as a result of radium therapy. Adenocarcinomas are in the minority and the small number for which treatment has been given were of the lower grades of malignancy and as a rule they furnished a slightly better prognosis than squamous-cell epitheliomas with irradiation therapy.

Grade of Malignant Change

The grade of malignant change is a very valuable contribution to our knowledge of malignant disease. A broad view of malignant disease taught us that the individual, the site of involve-

TABLE V. RESULTS OF RADIATION THERAPY FOR CARCINOMA OF THE UTERINE CERVIX, BASED ON THE GRADE OF MALIGNANT CHANGE

Group	Patients treated	Patients traced	Lived five years or more after treatment	
			Number	Per cent*
Grade 1	5	5	2	40.0
Grade 2	135	122	40	32.8
Grade 3	407	362	125	34.5
Grade 4	336	307	105	34.2
Total	883	796†	272	34.2

*Percentage of traced cases.

†90.7 per cent traced, total 1,491 cases.

ment and the gross characteristics of the disease did furnish valuable data; however, their interpretation was not very clear. From the standpoint of the surgeon and the radium therapist we can assume that grading of the malignant change does furnish an opinion of the pathologist to guide our therapeutic endeavors. The surgeon fully appreciates the fact that the majority of patients who have malignant disease of high grade do poorly regardless of the method of surgical intervention, whereas carcinomas of low grade have a much better surgical prognosis. For the radium therapist, grading of neoplasms has furnished the basis for a therapeutic rationale.

Briefly stated, there are two elements in a malignant tumor. One is the characteristic tissue cell that makes up the parenchyma of the tumor and the other is the stroma or supporting matrix with its varying degrees in amount and kind of cellular infiltration. It is reasonable to assume that there are intrinsic and extrinsic factors that influence these elements. These reactions are very complex and for the present may be considered a life process that in a measure can be influenced by the factors employed in therapeutic radiology. Surely, this is a phase of radiosensitivity the nature of which is not too well or only very incompletely understood. The more we master or control these influences or reactions, the greater or better will be the result of our therapeutic endeavors. As has been stated, carcinomas of high grade respond poorly to surgical intervention and respond more satisfactorily to radiotherapeutic methods, as is clearly shown in the statistic results obtained in cases of carcinoma of the uterine cervix. Our surgical experience further shows that low grade car-

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TABLE VI. AGE ACCORDING TO GRADE OF MALIGNANT CHANGE*

Age, years	Grade 1		Grade 2		Grade 3		Grade 4	
	Number of patients	Per cent	Number of patients	Per cent	Number of patients	Per cent	Number of patients	Per cent
20-29	0		0		9	56.3	7	43.7
30-39	0		24	14.2	71	42.0	74	43.8
40-49	3	1.0	40	13.7	120	41.1	129	44.2
50-59	1	0.4	45	16.9	82	30.7	139	52.0
60-69	1	0.8	25	20.0	46	36.8	53	42.4
70-79	0		1	7.7	7	53.8	5	38.5
80-89	0		0		1	100.0	0	
Total	5	0.6	135	15.3	336	38.0	407	46.1

*883 cases.

cinomas respond well to surgical intervention. With these data as a working basis, some investigators have assumed that carcinomas of low grade are radioresistant. Evidently the latter conclusion is only partly correct in that such carcinomas will respond to proper treatment and that adequate treatment seems to give at least the same degree of good results for carcinomas of both low and high grades. It is incorrect to assume that, because carcinomas of high grade are radiosensitive, carcinomas of low grade should not be radiosensitive.

The data in Table V are submitted to corroborate the aforementioned statement regarding influence of grade of malignant change on the five-year survival rate. There were 883 cases in which the lesions were graded and 796 of these cases were traced. Of these 796 patients, 272 lived for five years or more, a survival rate of 34.2 per cent. The total cases are subdivided according to the grade of pathologic change. Treatment for lesions graded 3 and 4 gave equal percentages of five-year survival rates which are similar to the average percentage for the group. There are very few lesions grade 1, and when encountered they prove to be adenocarcinoma. The grade 2 lesions are also in the minority. The five-year survival rate in cases of grade 1 lesions was 40 per cent; grade 2 lesions, 32.8 per cent. In general, tumors of low grade in our experience have given a slightly increased survival rate when compared with lesions of high grade, provided that the patients are not treated according to rule but according to their mode of response to the treatment.

TABLE VII. THE AGE GROUPS OF ALL CASES COMPARED TO THE AGE GROUPS OF THE GRADED CASES.

Age, years	All cases		Graded cases	
	Total	Per cent	Total	Per cent
20-29	28	1.9	16	1.8
30-39	284	19.0	169	19.1
40-49	496	33.3	292	33.1
50-59	452	30.3	267	30.2
60-69	208	13.9	125	14.2
70-79	22	1.5	13	1.5
80-89	1	0.1	1	0.1
Total	1,491*		883†	

*58.9 per cent of all cases.

†91.9 per cent of patients traced.

Influence of Age on Grade of Malignant Change

The influence of age on grade is also misunderstood in that some observers are of the opinion that young patients have carcinomas of high grade and that old patients have carcinomas of low grade. Study of carcinomas of the uterine cervix does furnish some data, especially concerning lesions of high grade, whereas the number of low grade lesions is relatively small for an analysis. In Table VI the ten-year age groups were arranged according to the grades of malignant change. When the percentages of distribution of age groups and grades are compared, there seem to be no outstanding differences. The distribution of ages compared equally throughout the table. Only 883 lesions of the total of 1,491 patients were graded, so an attempt was

made to determine whether the age distribution indicated in Table VI was representative of all the cases. In Table VII, the respective age groups are shown for both the graded cases and the total number of patients in the study. The similarity between the percentages of all cases and those of the graded cases in regard to their respective age groups should be noted; for example, the age group forty to forty-nine years, in which there were 496 patients (33.3 per cent) for all cases, whereas the number of cases in which lesions were graded in the same age group was 292 (33.1 per cent).

The data in this study show rather clearly that the age distribution and distribution of malignant change favor no special age group. The young and the old patient may have a carcinoma of low or high grade.

Technic of Treatment Employed

The radium technic employed at the clinic in the treatment of carcinoma of the uterine cervix may be defined as an intensive, multiple or broken-dose method.³ The radium or radon content of the universal tubes is in the range of 50 mg. or millicuries, respectively. The filters are kept constant. The only variables in the technic are the treatment time and the time between applications. The patient, however, represents an unlimited amount of variables. To vary the treatment time and the time between applications makes it possible for the radium therapist to treat his patient individually. The technic furnishes the widest distribution of the therapeutic energy throughout the field of the primary lesion. Another valuable attribute is that the primary field receives apparently adequate therapy, whereas the adjacent normal tissues receive the maximal radiation or the amount of radiation which they seem to tolerate. The primary lesion is treated with radium therapy as the initial procedure and roentgen-ray therapy is given as a supplemental treatment at the completion of the applications of radium. All patients, while treated and observed, are in the knee-chest position. The hospital stay is reduced to a minimum in that the plan necessitates that the patient remain at rest in bed only during the time of application. The number of days spent in the hospital varies from eight to ten, whereas the total time required for treatment varies

from four to five weeks on an average for patients whose disease is in stage 3.³

Briefly stated, an ideal technic for radium therapy is one that can be applied with very little or no risk to the patient and at the same time will adequately influence the primary lesion and, if possible, the adjacent metastatic deposits. The technic so briefly outlined previously is not at all perfect; however, it does approach the ideal technic as defined.

The Experience of the Radium Therapist

The experience of the radium therapist is a valuable contribution to the science and art of radium therapy. The skill and practical wisdom gained by personal knowledge based on study and repeated observation do become reflected in the immediate and late results obtained. His task is not a simple one; instead, it is exceedingly complex. For example, the surgeon speaks of surgical judgment and we respond immediately in that we appreciate in a measure the meaning that he wishes to convey. With the same feeling we may mention radiotherapeutic judgment. The patient must not only tolerate and overcome the effects of the therapeutic procedure employed but also the therapist must interpret, in a measure at least, the probable response which the patient will make to a given procedure in order to obtain an initial good result which will eventually affect the five-year survival rate.

The work of the radium therapist in the early years of development of the field was more than double that of the radium therapist of today. The early worker had to acquaint himself with the radium applicators and the pathologic lesion which the patient presented. After almost forty years of work in this relatively new field of therapy for carcinoma of the uterine cervix, several technics have been comparatively well standardized. However, as yet, no worker in our field has been able to standardize the patient. So every patient who presents herself for consideration is a challenge to the radium therapist. With the diagnosis, the gross character of the tumor, the patient's general health, and the proper selection, timing and spacing of applicators, the initial result may be very encouraging and it may exceed our expectations and endure for many years. No patient should receive more irradiation than that which is necessary to heal

the lesion under treatment. The adjacent tissues should receive no more exposure to the therapeutic rays than will be tolerated with safety.

In Table VIII the data of the fifteen-year period are divided into three periods of five years each. The irradiation technic employed in the first period showed 8.3 per cent as the incidence of cure for five years or more. The second and third periods gave equal incidences of cure, 34.9 and 34.7 per cent, respectively, for five years or more. The difference in incidence of cure of the first period and that of the second period is significant, and the chief factors that brought about such a change were a change in the therapeutic technic, a better appreciation of the radium applicators, a better understanding of the patient's response to treatment and a better distribution of the therapeutic rays in the field of treatment. Prior to 1923, all carcinomas of the uterine cervix received moderate voltage (135 kv.) roentgen therapy and beyond that date so-called high voltage (200 kv.) roentgen therapy was employed. It seems evident that, as our knowledge and experience increased, the incidence of cure for five years or more also increased, especially so, following the first five-year period.

Hospital Mortality

The hospital mortality for the entire group of 1,491 patients was 1 per cent.² There were fourteen deaths (Table II) in the stage 3 and 4 groups (1.4 per cent). In the stage 1 and 2 groups there were no deaths, whereas in the modified group (all stages) there was one death. The period of treatment and observation necessary for completion of the irradiation technic requires about five weeks. The actual hospital stay is about ten days. Every endeavor is made to keep the patients ambulatory between treatments. When one recalls that the major groups in this study are patients who had extensive lesions, with varying degrees of actual and potential serious complications, it is stimulating and highly encouraging to know that they can be effectively treated with so little risk.

Treatment for Recurrences

Recurrence of carcinoma of the uterine cervix, in a strict sense, is rare today, in that surgical therapy is not employed as it was years ago in the management of such cases. Some of the

TABLE VIII. CARCINOMA OF THE UTERINE CERVIX TREATED WITH IRRADIATION ALONE. RESULTS TABULATED ACCORDING TO PERIODS IN WHICH TREATMENT WAS GIVEN

Five-year groups inclusive	Patients treated	Patients traced	Lived five or more years after treatment	
			Number	Per cent*
1915-1919	288	264	22	8.3
1920-1924	556	410	143	34.9
1925-1929	647	571	198	34.7
1915-1929	1,491	1,245 (83.5%)	363	29.1

*Percentage of traced cases.

patients included in this study did have major surgical procedures performed, as well as an initial course of irradiation therapy (in the main, elsewhere, however), and the majority evidently were treated with apparently insufficient surgical intervention and irradiation. The treatment did bring about what might be termed superficial healing and thus reduced the tendency toward hemorrhage, local ulceration and toxic absorption. This favorable influence was reflected in the comparatively favorable status of general health. In some, there was extensive radionecrosis, and in adjacent tissue active carcinoma was present. The treatment which they had received did change the actual gross appearance of the lesions and naturally did restrict the subsequent limited radium therapy employed here. This is the main reason why the cases are grouped separately and are termed "modified." These cases are deserving of a more adequate and complete analysis. As a rule, treatment for such a group is very tedious; for example, the radionecrotic tissue must be protected or shielded from further exposure while the adjacent active tissue is actively treated. The anatomic relationships are altered, making it difficult, and in some cases impossible, to locate the cervical canal and uterine cavity. In a consideration of these patients, one is tempted to evaluate the importance of sentiment in the treatment and consulting room. The relatives are very solicitous and are anxious that something further be done, in that they do not want hope taken from the patient. Every endeavor should be made to acquaint the relatives with the risk and ultimate guarded prognosis; if they are willing to share the responsibility, a limited treatment usually can be applied. At least, bleeding, odor and pain

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TABLE IX. RESULTS OF TREATMENT (WITH IRRADIATION ALONE) OF CARCINOMA OF THE UTERINE CERVIX PREVIOUSLY MODIFIED BY VARIOUS TREATMENTS ELSEWHERE. PERCENTAGE SURVIVAL RATES AND STAGE OF INVOLVEMENT AT THE TIME OF THE SUBSEQUENT TREATMENT

Stage of involvement (modified)	Patients treated	Patients traced	Lived five or more years after treatment	
			Patients	Per cent of those traced
1	4	4	4	100.0
2	28	25	14	56.0
3	297	267	53	19.8
4	83	74	3	4.0
Total	412*	370	74	20.0

*One patient died during the course of subsequent treatment, a hospital mortality of 0.2 per cent.

can be favorably influenced. It is surprising to know that members of this group have a chance to survive five years or more, especially the stage 3 and 4 groups.

The small number of cases (Table IX) in the stage 1 group no doubt accounts for the unusual incidence of five-year cures and more than five-year cures obtained. It may emphasize also the importance of a careful follow-up system, in that, when adequate therapy is applied to small regions in which a recurrence has occurred, the period of palliation may be substantially extended. As a rule, further palliation does occur in all cases. It is possible, for example, to arrest the infiltration into the anterior vaginal wall; thus, a vesicovaginal fistula may be prevented or at least its formation may be delayed sufficiently to be of minimal distress to the patient. This is equally true of the prevention of rectovaginal fistula and probably unilateral or bilateral hydronephrosis. In a selected number of cases in which fistulas were present, and after suitable treatment and an interval to allow the tissues to approach a normal status, surgical intervention was then done for the correction of the anatomic defects. Our early results have been very encouraging. Three in the stage 4 group survived. One assumption is possible, in that all of the cells which infiltrated the region were not actively malignant.

Evidently these patients with so-called recurring carcinoma do deserve our best efforts in that with limited treatment and medical and surgical care they have a chance of survival for five years or more, and in nearly all cases the period of palliation can be definitely lengthened.

Summary

No attempt has been made to exhaust the topic under consideration or the data this group of patients furnished, nor have definite conclusions been formulated. However, there are some interesting factors for analysis, although the statements made may be incorrect. The study of this group has advanced our knowledge of this disease and the patients treated today should receive superior therapy and a better result should be theirs when compared with those of previously treated patients. Naturally, the extent of the local and distant malignant lesions, the age of the patient and his general health or vigor are the most important factors which will definitely limit the survival rates over a period of five years or more. From the standpoint of the radium therapist, the method or technic which he employs and the completeness with which the initial radium therapy is applied, based on judgment and skill, have a definite bearing on the immediate result and ultimate prognosis. Careful consideration by the experienced therapeutic roentgenologist should be given to those patients who are to receive supplemental primary and subsequent roentgen therapy. Patients who have recurrent lesions should be treated with care and consideration, for they can be definitely benefited and some will survive for five years and longer. All concerned must coöperate to obtain the utmost in "cure" and palliation for patients who have carcinoma of the uterine cervix.

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INHIBITION ILEUS*

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THE main purpose of this paper is to review briefly the present day methods of treatment of paralytic or inhibition ileus. It is a very common surgical complication; yet it is often difficult to recognize early and to treat successfully.

This type of ileus is not due to any form of mechanical obstruction, but is due to either a change in the intestinal wall, or to interference with its nerve supply, resulting in an inhibition of normal intestinal movements and a functional inactivity of the bowel.

Etiology

Paralytic ileus is noted most often in the presence of peritonitis. Varying in duration and degree, it is seen following every intra-abdominal operation, but, fortunately, the distention, nausea and vomiting usually subside in eight to twenty-four hours, when the dilated gut begins to contract with the production of "gas pains." During the performance of a laparotomy, trauma, exposure of the bowel to air, and packs that are too hot or too cool are frequently factors in producing adynamic ileus. Several writers have noted that worried, apprehensive patients are somewhat prone to develop postoperative ileus. Penetrating abdominal wounds, the extravasation of blood, and mesenteric thrombosis are also etiologic factors. Paralytic ileus may be of nervous origin, as the result of injuries and diseases of the spinal cord, or fracture of the lower ribs or lead poisoning. It may be of toxic origin as in pneumonia, uremia, undulant fever, meningitis and empyema. And it may be reflex as noted in renal or gallbladder colic, torsion of an ovarian cyst, crushing of a testis or strangulation of the spermatic cord.

Pathology

A progressive dilatation of the bowel with a corresponding thinning of all the layers of the intestines is the only pathological change noted in early paralytic ileus. As a result of this distention, intestinal secretion is increased, while the venous stasis diminishes absorption from the

bowel, so that large amounts of stagnant toxic fluid collect in the gut. Swallowed air, fermentation and gas-producing organisms also play a part in increasing this distention. At first the bowel is normal in appearance, but the persistent venous stasis, produced by the extreme dilatation, causes it to become progressively lavender, purple, black and gangrenous. The intra-abdominal exudate may be serous, fibrinous or fibrinoplastic.

Signs and Symptoms

In paralytic ileus, the predominating sign is abdominal distention, which usually involves the entire bowel. The pain, if present, is not intermittent or colicky in character, but is described as being a continuous dull generalized abdominal ache. As the tympanites increases, the pylorus relaxes, permitting intestinal contents to regurgitate into the stomach, producing nausea and later vomiting. Respirations become rapid and shallow, due to the marked increase of intra-abdominal pressure. The pulse is rapid and thin. The patient appears to be alert and apprehensive at first, but gradually becomes drowsy, cyanotic, and comatose. Delirium often supervenes before death. Peristalsis is relatively or completely inhibited, resulting in a "silent abdomen." A scout film will show a gaseous distention of both the small and large bowel, fluid layers between the coils, fluid mirrors in which air is layered over fluid, and frequently a so-called "ladder pattern" is noted.

Treatment

Prophylactic treatment is extremely important in adynamic ileus. Preoperative care includes mental preparation of patient, because a "nervous," worried patient is more susceptible to stimulation of the sympathetics, with a resultant inhibition of peristalsis. Therefore the fears and apprehension of all such patients should be allayed as much as possible.

Cathartics should not be given before surgery. Alvarez has shown that, following purgation, there follows a period of inhibition of peristalsis.

In the operating room prophylaxis is very important. The intestines must be handled very

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gently, they should be exposed to the air as little as possible, and blunt dissection should be avoided. Proper temperature of all moist laparotomy packs must be maintained; and careful hemostasis must obtain, because free blood in the abdominal cavity acts as a peritoneal irritant. Soresi and Brown, among others, advise dilating the anal sphincter before the patient leaves the operating room, to permit gas to escape freely from the rectum.

Postoperatively, all liquids by mouth should be withheld until nausea and vomiting have subsided. A common practice is the routine application of heat to the abdomen, by stupes or the use of a cradle equipped with electric bulbs, or short wave diathermy, until signs of ileus have subsided.

After establishing a diagnosis, morphine is a very useful drug, and may be used freely in paralytic ileus. We formerly believed that morphine "splinted" the bowel, but recent studies have definitely demonstrated that it increases its tone. Ochsner states, "Morphine should be administered liberally after operation (in the case of an adult, unless some contraindication exists, the patient should receive $\frac{1}{4}$ grain of morphine sulphate every four hours whether they complain of pain or not), because, as has been shown repeatedly both in the laboratory and the clinic, morphine increases the intestinal tone and does not inhibit the gut as is commonly thought."

If these preventive measures are unsuccessful, and paralytic ileus develops, prompt and energetic treatment is necessary.

1. To combat the dehydration, starvation and hypochloremia, saline and glucose solutions must be given intravenously. Hypertonic salt solutions are very useful not only to replace the chlorides that are lost, but also to stimulate peristalsis. Wangenstein states that, " $\frac{1}{10}$ to $\frac{1}{3}$ gram per kilo body weight may be safely injected. 75 to 100 cc. of a 15 per cent solution of sodium chloride is the usual dose for a person weighing 150 pounds."

Glucose solutions may also be given, by hypodermoclysis or intravenously. Ochsner and Gage report that they have demonstrated that glucose intravenously inhibits peristalsis, but that this effect is lost when sufficient insulin is given to "cover" the full amount of dextrose administered.

Sufficient fluids should be given to maintain a daily urinary output of 700 to 1,000 c.c.

2. Different drugs, used to stimulate intestinal activity, have been used with variable results. Chief among these are physostigmin (eserin), prostigmin, pitressin, choline and acetylcholine.

Physostigmin produces powerful contractions of the smooth muscle of the intestines, probably by stimulating the vagus. It must be used with considerable caution, however, because larger doses than 1/30 gr. hypodermically may produce central vasomotor paralysis, cardiac depression, dyspnea, myosis, drop in blood pressure and tetanic contraction of the gut.

Because of these undesirable side-effects, physostigmin has been supplanted to a great extent during the past few years by prostigmin, which is a white crystalline powder that forms a very stable solution. It is obtainable in two concentrations, a 1:4000 solution for prophylaxis, and a 1:2000 solution for treatment. The prophylactic dose is 1 c.c. of 1:4000 solution every six hours starting the day before surgery and continuing until the second or third day postoperative. The treatment dose is 1 c.c. of 1:2000 solution, repeated as necessary. Beck, in a report of 220 cases, reports that prostigmin has a marked effect upon the intestine without affecting the heart. Gaenssle reports that this drug has no unpleasant effect upon the heart. Saegesser and others also comment on the absence of by-effects.

Pitressin, which contains the pressor substance of the posterior lobe of the pituitary body, often gives satisfactory results in relieving intestinal distension. It is administered in 1 c.c. doses, repeated as indicated.

Choline and its derivative, acetylcholine, occur in animal and vegetable tissues and in some drugs, especially ergot. Their effect upon the intestine is similar to eserine.

Canney reports a cure in 75 per cent of his cases of postoperative ileus by the use of choline chloride. Abel advises intramuscular injections of acetylcholine in 0.1 gm. doses every two or three hours until gas is expelled.

3. Enterostomy. Until Wangenstein demonstrated the splendid results that can be obtained by the use of the indwelling nasal suction

catheter, enterostomy was generally considered the mainstay in the treatment of paralytic ileus. While this surgical method of draining the intestine has often been a life-saving measure, it is, as Wangensteen points out, "only of very limited value because only a short segment (of the bowel) on either side of the enterostomy catheter is evacuated by the tube." For this reason several surgeons have, in the past, advised performing multiple enterostomies. The present day concept of the comparative value of these two methods of intestinal drainage, is, I believe, aptly put by Jackson when he states "that in a general way an enterostomy is indicated in all cases of adynamic ileus requiring intestinal drainage, where for any reason nasal catheter suction cannot be employed, or results cannot be obtained by its use." In other words, the nasal suction apparatus has supplanted the enterostomy as the method of choice in draining the bowel in cases of paralytic ileus.

4. Spinal anesthesia. The splanchnic or sympathetic nerves, which act as inhibitors of the intestines, are blocked by spinal anesthesia. By shunting out the influence of the sympathetics, the motor nerves are unopposed and active peristalsis results. Since in paralytic ileus there is an overactivity of the sympathetic nervous system, it is highly desirable to block out its influence on the bowel. For this reason, spinal anesthesia is widely used in this type of ileus. Splanchnic analgesia is employed by some men, but, according to Brown, the technic is more difficult and likewise more dangerous. He advises using three-fifths the spinal anesthesia dose because that amount of anesthetic does not produce a great fall in blood pressure and is fairly safe when given below the first lumbar vertebra. It should be added that in combating this drop in blood pressure adrenalin or ephedrine should not be given because they stimulate the sympathetics and thus have a tendency to neutralize or offset the effect of spinal block. Therefore, intravenous saline or glucose should be given to counteract the fall in blood pressure.

5. Decompression by nasal suction catheter. In reviewing the literature on ileus of the past seven or eight years, it is interesting to note the influence that Wangensteen has exerted in the treatment of this condition in advocating the use of the inlying duodenal tube. When his first papers appeared describing this form of therapy,

contemporary writers were discussing the merits of single and multiple enterostomies, ileocolostomies, gastric lavage and various drugs. Since that time the use of the nasal suction apparatus as the method of choice in treating paralytic ileus has, in general, superseded all other forms of therapy. The value of its use in competent hands can best be pointed out by citing the experience of Wangensteen, who states that since 1931 when suction first began to be widely employed at the University of Minnesota Hospitals in the treatment of distention, no patient with paralytic ileus has been subjected to operation for its relief. The long double-lumened, balloon-tipped intubation tube, developed by Miller and Abbott in 1934, is a further advancement in the treatment of ileus by decompression. By means of this tube it is possible to decompress the entire small bowel.

Summary of Treatment

Prophylactic

1. Proper preoperative care, including mental preparation. Avoid the use of cathartics.
2. During a laparotomy avoid traumatizing the bowel and exposing it to air. Maintain good hemostasis.
3. After operation, withhold fluids by mouth until nausea and vomiting have subsided. Application of heat to abdomen is advantageous.
4. Proper sedation. Morphine is very useful. It increases the tone of the bowel and promotes intestinal activity.

Active Treatment

1. Prevent dehydration and starvation and maintain the body chemistry. Hypertonic saline solutions replace chlorides and stimulate peristalsis. Glucose solutions should be given intravenously, "covered" by insulin.
2. Drugs to stimulate activity of intestine should be used with discretion. Eserin is somewhat dangerous. Prostigmin and pitressin are probably most useful.
3. Enterostomy is seldom necessary.
4. Spinal anesthesia is often effective in promoting intestinal motility. When used, three-fifths the anesthetic dose is recommended. Intravenous glucose or saline, instead of adrenalin or ephedrine, should be given to combat the drop in blood pressure.
5. The nasal suction catheter is our mainstay in the treatment of paralytic ileus.

EPISIOTOMY

Description of a New Instrument for Presuture Method

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The presuture method in episiotomy or the placement of sutures before episiotomy is performed, has long been advocated, but the technical difficulties involved have made the method unpopular. The need for further anesthesia for repair of an episiotomy results too often in the

cous membrane. As each suture is drawn through, it is cut, leaving long ends, the last one being double. With the sutures inserted and their ends grasped with forceps, the perineum is cut, the scissors following the groove of the instrument.

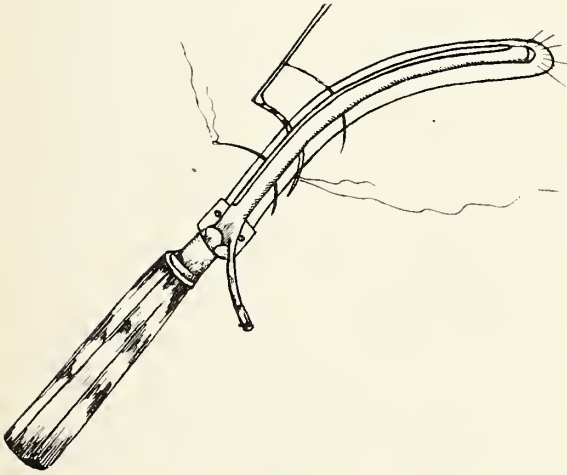


Fig. 1. Drawing of instrument, with electric attachment, showing relations of needles between tube and spatula.

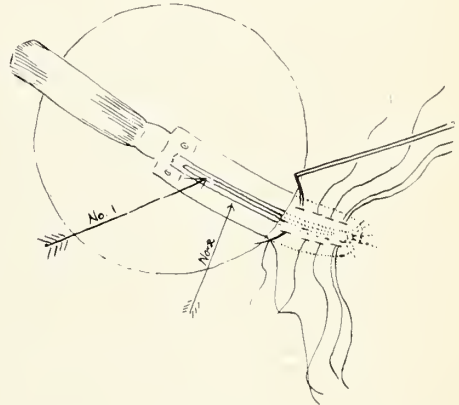


Fig. 2. Drawing of instrument, with battery in the handle, showing application. No. 1 is the groove along which the scissors are guided in making an incision. No. 2 is the tube attached at the proximal end under which the needle is passed.

omission of this valuable procedure. As an incentive for more general use of episiotomy by the general practitioner, who so often suffers from lack of trained assistants and proper illumination, an instrument is offered.

This instrument consists of a spatula-like blade, curved to conform to the infant's head, on the convex surface of which lies a curved rod attached only at the proximal end. The needle is directed underneath the rod, which is grooved for directing the scissors.

The instrument is inserted when the perineum is moderately distended at the time when episiotomy is indicated and pressure of the oncoming head or downward pressure by the operator produces an elevated outline, which facilitates the introduction of the sutures.

The sutures, threaded on a curved cutting needle carrier, are introduced through the intact perineum and beneath the tube, which acts as a guide, beginning at the junction of skin and mu-

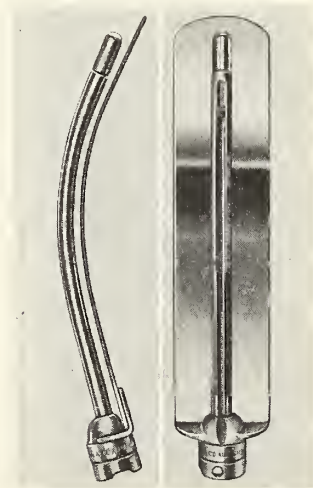


Fig. 3. Side and front views of the blade of the instrument.

The skin, urogenital septum, constrictor cunni, transversus perinei and some fibers of the puborectal portion of the levator ani are sev-

ered, resulting in a triangle-like incision with its base in a mid-lateral direction from the vulvar outlet.

In the final tying, the first or vagino-dermal stitch is used as a retractor while the depth of the incision is inspected. The deep muscles are approximated by an internal stitch, using one of the double strands previously inserted, which constitutes a "spare," carried where it is conveniently available. The stitches are now tied from below upward to complete the operation.

To remember that one's stitches are placed and held by forceps no matter what possible complication may be encountered is very consoling.

The instrument may be used without the services of an assistant. There is no need for

extending the anesthetic. There is no interference in the repair by untimely expulsion of the placenta. Time can be taken for resuscitation of the baby or meeting any other emergency, with the knowledge that the repair of the perineum only requires the tying of already placed sutures.

NOTE—The instrument has proven of value in cholecystectomy as a retractor and illuminator and in carrying a ligature. It is also of use as a retractor in inspecting the bed of the tonsil after a tonsillectomy.

The instrument is manufactured with battery in the handle,* in which case it is sterilized in lysol solution, wrapping the handle in a sterile towel; and with electric attachment, which instrument can be boiled.

*Manufactured by the Welch Allyn Company.

OCULAR TUBERCULOSIS—ITS SIMILARITY TO LEPROSY*

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THIS paper is not presented in order to stimulate undue interest in such a rare condition as ocular leprosy. Recently, I made a statistical study of leprosy of the eye under the sponsorship of the Public Health Service and I was struck with the apparent resemblance of the gross and microscopical ocular lesions to those of tuberculosis. Accordingly it is my aim to recapitulate our present-day knowledge of tuberculosis of the eye and call to mind its close relationship to leprosy.

Many writers have called attention to the similarity between the generalized lesions of leprosy and tuberculosis but, due to the comparatively few who have investigated the ocular lesions of leprosy, this analogy has not been seriously stressed.

The diagnosis of tuberculosis of the eye is still a much disputed question. We in this country, and especially in our section of the country, still emphasize focal infection as the cause of most of our doubtful and smouldering intra-ocular infections. This tendency, however, is much less today than it was twenty or thirty years ago, due largely to painstaking investigations by Ger-

man oculists and several in our country. Nevertheless, we are still puzzled as to why 50 per cent of uveitis cases in Austria and Germany should be diagnosed as tuberculous as against about 10 per cent in the United States. Kronfeld³ and Woods⁸ are of the opinion that many of the minimal roentgenological and physical lung findings in Germany would be considered normal by American internists. The universally accepted opinion, however, seems to be that ocular tuberculosis is secondary to some remote tuberculous foci which are usually located in the peribronchial glands and that the infection travels to the eye by means of the blood stream.

It would not seem necessary to call to mind all of the signs and symptoms of a tuberculous uveitis with which no doubt we are all familiar. Lloyd⁴ summarizes the principal features as:

1. Limitation of process to part of the eye involved.
2. Tolerance of the eye to the process without pain or undue redness.
3. Sharpness or insidiousness of onset.
4. Its chronicity and tendency to relapse.

Woods⁸ warns that we must consider:

1. The character and course of the eye lesion

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and the correlation of this with other similar lesions previously shown to be tuberculous by histological examination.

2. The exclusion of other possible etiological factors.

3. A study of the general tuberculous status of the patient.

4. The reaction of the patient to tuberculin.

Many of us are no doubt guilty of occasionally disregarding these signs and precautions in attempting to diagnose ocular tuberculosis and attach entirely too much significance to the skin tests, in spite of the fact that we are aware that a positive reaction to more than .001 mg. of tuberculin means nothing, and even this positive reaction only signifies a previous tuberculous infection or rather "hypersensitivity" of that particular patient. Werdenberg,⁷ in his recent review of ocular tuberculosis, states that the diagnosis remains only "probable" as long as no tubercle bacilli have been found and the tuberculin test can be used only with reference to the general pathologic picture. It is generally recognized that the majority of patients, however, with a *clinically diagnosed* tuberculosis of the eye will react positive to .001 mg. of tuberculin. King of Boston in a recently read paper reported 70 per cent positives out of a series of 1,350 patients of this type. Friedenwald and Dessoff's¹ percentage of positives is slightly lower than this in their *clinically* and *histologically* diagnosed cases and they brought out the very interesting fact that between 40 and 47 per cent of this series failed to react to stronger dilutions than .001 mg. of tuberculin and thus resembled normals. We can therefore understand the need of a ratio between cutaneous and ocular sensitivity in tuberculin diagnosis and therapy as the only indicator we have, at present, is the cutaneous. There is and has been research work along this line lately.

In view of the unreliability of the diagnostic skin tests in tuberculosis, we are forced to look upon any smouldering recurrent and resistant eye condition as "possibly tuberculous" in origin; this, of course, after we have completed thorough foci investigation.

It might be well to mention here that "Purified Protein Derivative" of the tubercle bacillus, as isolated by Seibert⁵ and approved by the American Council on Tuberculosis, is at present being preferred by many men for diagnosis. Also that

the much recently publicized Gruskin² diagnostic test is being viewed with some skepticism by some of our local internists.

There are no diagnostic skin tests in ocular leprosy, but the diagnosis is easy as the disease has usually progressed for some time before the eye is attacked. Both tuberculosis and leprosy affect almost any portion of the eye or adnexa. Both are caused by remarkably similar acid-fast organisms. The leper bacillus is slightly longer and more slender than the tubercle bacilli and usually exhibits no beaded appearance).

These bacilli reach the eye by means of the blood stream through a bacillema which occurs at some time during the course of the disease. Tubercle bacilli might be hard to demonstrate in an eye lesion, but not so with leprosy, for thousands of them may be found in an ordinary sectioned cornea of leprous keratitis.

The Conjunctiva

Tuberculous and leprous involvement of the conjunctiva is rare. In an examination of 350 lepers I did not see a single involvement of the tarsal conjunctiva which I thought to be leprous. Tuberculosis of the tarsal conjunctiva usually occurs in the form of follicles or ulcers. These follicles, supposedly from movements of the lids, sometimes become elongated and pedunculated, thus producing the so-called "cock's comb excrescences." The ulcerative types sometimes result in polypoid formations. The bulbar conjunctiva also seems to be fairly immune from these diseases, except of course to participate in the underlying corneo-scleral involvement in both diseases.

Phlyctenulosis is usually primarily conjunctival and is thought to be closely allied to tuberculosis. Although no actual tubercle bacilli can be demonstrated in a phlyctenule, they are usually observed in persons with a tuberculous diathesis and are supposedly a response to tuberculin toxin.

The Cornea

The cornea is quite vulnerable to tuberculosis and leprosy, seemingly more so to the latter disease. It is almost always secondarily involved from the uveal tract. Deep infiltrations which usually emanate from above or from either side of the cornea, followed by an abundant mesh-work of vessels, form the most characteristic

lesion. Pannus formation is also very common in leprosy and the studded appearance of this change is fairly typical and diagnostic. Posterior precipitates are common in both conditions and the usual end-result is a sclerosing keratitis. Tubercle bacilli are not commonly found in these corneal infiltrates but leprosy bacilli are plentiful.

The Sclera

Although scleral involvement by tuberculosis and leprosy have a striking resemblance, the scleral tissue proper with its closely packed fibers in general offers stiff resistance to the invasion of these acid-fast organisms, and by far the greatest number of lesions are seen at the corneo-scleral margin and in the episcleral tissues.

In a series of twenty-eight sectioned lepers' eyes, which I examined recently, no bacilli were found in the deeper layers of the sclera. Of course, the avascularity of this tissue may be a factor here.

The Uveal Tract

As may be expected in a tissue with an abundant blood supply, tuberculous and leprosy involvement of the iris, ciliary body and choroid are quite common, and in most cases the uvea forms the starting point of the diseases. The clinical picture in the iris is quite similar. Usually there is very little or no pain, a negligible amount of pericorneal and stroma injection, some "K.P." spots and posterior synechiæ, and we may or may not observe tubercles or leprosy nodules in the stroma. Tuberculosis of the iris usually occurs in one of three forms.

(a) The usual chronic type in which one or several tubercles may be observed deep in the stroma, usually in the most vascular portions (pupillary or peripheral). Here we may also see "Koeppe bodies" at the pupillary fringe, which, although seen in this disease, contain no bacilli or giant cell systems and are thought by some to be an allergic manifestation like the phlyctenule, as their histologic appearance is quite similar.

(b) Miliary tuberculosis, in which small, gray, translucent tubercles exhibit themselves throughout the stroma, may be located deep or superficial.

(c) Conglomerate tuberculosis of the iris forms a large caseating mass usually coming from the angle of the anterior chamber. Types

"b" and "c" are not common. It is estimated that tubercles can be observed in about one-third of all iris tuberculosis.

Leprosy of the iris has a very insidious course and resembles the miliary form of tuberculosis in the later stages when numerous glistening white, pinpoint nodules collect on the surface of the iris, either uniformly or in clumps. However, these nodules, unlike tubercles, have a tendency to protrude from the surface and some may even seem to be pedunculated. There are many synechiæ. Proliferation of iris pigment and atrophy of the stroma, especially around the pupillary portion, is quite marked.

Tuberculosis and leprosy of the ciliary body consist principally of infiltrations in the anterior and stromal parts, especially around the ciliary major which eventually lead to caseation, perforation and atrophy. Verhoeff states that anterior segment tuberculosis results from bacilli being carried here by the aqueous and vitreous as a result of an inward rupture of a tubercle through the epithelial layers of the ciliary body. This may be true of leprosy also, but I believe that the wandering corneal cells carry the bacilli to the peripheral parts of the cornea and thence throughout the stroma.

The Choroid

When tuberculosis of the choroid occurs in the posterior segment, the solitary tubercle often resembles a neoplasm. It usually forms near vessels and at first consists only of round cells; as it grows, however, caseation and giant cells appear microscopically and the lesion pushes forward, thins the pigment and appears ophthalmoscopically. Military tuberculosis of the choroid is fairly rare. Leprosy choroiditis likewise seems to be uncommon, despite the fact that bacilli can often be seen extending back through the pars plana of the ciliary body into the choroid with the microscope. In a fundus examination of 243 lepers, only fourteen lesions of the choroid or retinochoroid were observed and many of these I did not think directly due to leprosy.

Retina and Optic Nerve

Retinal tuberculosis consists for the most part in an endophlebitis or periphlebitis of the retinal vessels, especially the veins, in which a tubercle may form in the vessel wall or outside the vessel wall to involve the adventitia. This

subsequently leads to thrombosis, organization or aneurysmal dilatations, which in turn form intra-ocular hemorrhages and retinitis proliferans.

Van Lint⁶ recently demonstrated the fragility of vessels in pulmonary and ocular tuberculosis by using the "cuff method" to cause petechiæ and strongly advised calcium and vitamins to prevent hemorrhage.

Many conflicting reports exist as to retinal lesions or hemorrhages in leprosy, but my conclusions were that they are very scarce. The optic nerve is practically immune to leprosy and tuberculosis.

Treatment

There is no recognized treatment for ocular leprosy, although many remedies have been tried. The usual systemic and hygienic pro-

cedures, coupled with the cautious use of tuberculin, offer the best results in tuberculosis. The actual administration and dosage of therapeutic tuberculin will not be discussed here other than to state that we usually prefer Denys bouillon filtrate. Werdenberg⁷ has stressed the value of high altitudes in conjunction with the other tuberculous therapy.

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CONVULSIONS IN CHILDREN WHILE UNDER GENERAL ANESTHESIA*

Report of Case

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THE increasing frequency with which convulsions under general anesthesia are occurring in children, elicits this case report and brief résumé of the subject.

In view of the fact that about 85 per cent of these cases occur in children and young adults, we, who work with children, must be particularly concerned. The first reports appeared in the literature about 1927, and since then they have been occurring with such frequency that this alarming phenomenon demands the attention of all anesthetists, pediatricists and surgeons.

Case Report

The patient, an eleven-year-old white boy in perfect health, was awakened about midnight, January 11, 1939, with pain in the abdomen. He was seen early the following morning by Dr. David Siperstein, who made a diagnosis of acute appendicitis.

At the hospital the laboratory findings were: urine normal, white blood cells 17,500, polymorphonuclears

96 per cent (about 50 per cent being band forms). His temperature was 102.4.

Past history was negative except for an attack of infantile paralysis in 1935 from which he made a perfect recovery. He had never had an abdominal attack of pain like this before.

Physical examination revealed no abnormalities except for the abdomen, which presented the signs of acute appendicitis.

Preoperative medication consisted of a hypodermic administration of morphine sulphate gr. $\frac{1}{8}$ and atropine sulphate gr. 1/300 at 7:30 a.m.

Anesthesia.—This was induced by nitrous oxide and maintained by ether administered by the drop method. While the child was being placed on the operating table the surgical supervisor remarked that the child felt much warmer than his temperature chart indicated. In retrospect, I suppose that his marked temperature elevation had already begun.

Operation.—The abdominal cavity was opened through a right rectus incision. No free fluid was present in the peritoneal cavity. The appendix was readily accessible and appeared acutely inflamed. It was removed in the usual manner with very little trauma. On section the lumen was filled with pus.

After the anesthesia had been in progress about 15 minutes the anesthetist reported slight cyanosis and

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observed twitchings of the eyelids. The pupils were dilated but reacted to light. On temporary withdrawal of the ether, the color returned to normal and the twitchings ceased.

The operation was completed without any further mishap, and the patient left the table with the usual postoperative appearance. The pulse during the operation ranged from 110 to 120. The operating time was thirty-five minutes.

The patient was returned to bed at 8:50 a.m. and appeared slightly cyanotic. His pulse was 150 and respirations thirty.

About twenty-five minutes after returning to bed the child had a terrific convulsion, became blue and presented marked carpo-pedal spasm. His temperature following the convulsion was 108.4. Heart sounds and respiration ceased during convulsion and never returned.

Etiology

Lundy reviewed the literature in 1937 and listed thirty-three causes which have been advanced to explain convulsions following anesthesia. A word regarding some of the more likely causes may be timely.

1. *Impurities in the Ether.*—The British investigators have been unable to prove this point. Ether impurities are: acetaldehyde, peroxides, ethyl sulphide, ketones, and alcohol. The first three are toxic if present to the extent of 0.5 per cent or more. They have analyzed the ether being used at the time of the convulsions on many occasions and have never found these impurities present in toxic doses. Woolmen and Taylor operated upon a child on a hot day, under open ether. A convulsion occurred and the anesthesia was discontinued. Following the convulsion, the anesthesia was continued with ether from the same bottle, with no further convulsions. They feel that ether, per se, or its impurities is not the cause of convulsions. They reported four cases in 1935, with a mortality of 50 per cent. They state that this condition is one of ether's most serious immediate dangers, but fortunately it is rare. However, I think we all agree that ether is by far the safest anesthesia in general use.

2. *Ether Convulsion Diathesis.*—Kemp suggested that there was such a thing as an "ether convulsion diathesis," maintaining that "if an individual develops tetany during an operation under anesthesia the same individual will again develop tetany if he is reoperated at a later date." Willway operated on a three-year-old child under ether who had convulsions but re-

covered. Forty-eight hours later when the child was more toxic he operated again under ether and no convulsions occurred.

The patient in this report had a tonsillectomy in 1936 under ether anesthesia with no untoward effects, and one is inclined to doubt Kemp's theory.

3. *Over-Etherization.*—Ashworth stated that in about 85 per cent of cases of ether convulsions the following factors are present: (1) the patient is under twenty years of age; (2) he is suffering from intense toxemia as a result of a septic local infection; and (3) the operating room is very hot. He maintains that the determining factor in the production of ether convulsions under these conditions is *deep* ether anesthesia.

Mennell, reporting eight cases, believed that over-etherization with over-oxygenation might be the cause. However, convulsions have occurred in cases where no oxygen has been used and in this case no oxygen was being used. This patient was in moderately deep ether anesthesia but the pupils still reacted to light.

Dr. Ralph Knight informs me that convulsions have occurred under every known general anesthesia. One case under cyclopropane is reported from the University of Minnesota.

4. *Excess of Carbon Dioxide in System.*—Pinson felt that this might be the cause. He reported fifteen cases with five deaths, all in children or young adults with acute infections.

Against this theory some British workers feel that carbon dioxide is the most effective agent in its treatment. Carbon dioxide not only removes ether from the body but also heat.

Seevers, Cassels and Becker, at the University of Wisconsin, working with rats, have shown the following:

	No. of rats	Convulsions or Twitch Per cent
Ether + pyrexia	24	0
Ether + CO ₂ (below 17%)	24	21
Ether + Pyrexia + CO ₂ (7-12%) ...	52	50
Ether + Pyrexia + CO ₂ (13-17%) ..	42	64

These authors have made clinical demonstrations which show that carbon dioxide given in sufficient concentrations will of itself cause convulsions.

Knight agrees with these workers and feels that carbon dioxide should never be used in the

treatment of convulsions, but that oxygen should be given freely.

5. *Anoxemia of Brain Due to Edema and Collapse of Lung Bases.*—Gwathmey feels that this may result from failure to use proper pre-anesthetic medication. It is true that edema of the lungs is the only constant post-mortem finding, but on the other hand we have been using morphine and atropine routinely as preoperative medication for many years and it is strange that no cases were reported before 1927.

6. *Atropine Over-Dosage.*—In many of the case histories that I have reviewed, a much larger dose of atropine has been used than is ordinarily given at our Children's Hospital.

I found in the literature instances of convulsions following anesthesia in which doses of from 1/150 to 1/75 grain of atropine were given children ranging from three to twelve years old. These are large doses of atropine and in these cases may have played a significant rôle in the convulsions.

Hornabrook, in criticizing Pinson, maintained that he was using too large doses of atropine in conjunction with ether. The ether, he maintained, was in no way to blame.

Hornabrook likewise reminds us that medical men fail to realize that the same dose of a drug cannot be given to a patient when under anesthesia as can be employed with possible safety in a patient who is not under that influence. He informs us that atropine is safer with chloroform than with ether.

Hornabrook, with thirty years' experience as an anesthetist, says that between five and twelve years of age the dose should be 1/12 gr. morphine and 1/200 gr. atropine; these doses mean safety. He states that the symptoms of atropine poisoning are "convulsions followed by paralysis, stupor at times, alternating with delirium, coma, and death preceded by heart failure and failure of respiration. Death is due to asphyxia."

7. *Acute Toxemia.*—MacKenzie feels that this is the essential and predisposing condition and that ether is the exciting agent. However, there are reports in the literature where a child suffering from acute toxemia developed convulsions during the first operation, and when operated a second time within a few days did not have convulsions.

8. *Heat.*—Woolmer and Taylor suggest that

ether upsets the normal heat regulating mechanism of the body and heat-stroke may play a big part in the etiology.

Willcox describes the hyperpyrexia from heat stroke as follows: "The onset may be sudden, with rapid rise of temperature, coma, and convulsions; the skin is hot and dry, face flushed and cyanosed; pupils dilated, fibrillary twitchings of the muscles and convulsions usually occur—pulmonary edema is a terminal event."

This description fits well with ether convulsions. All cases manifest hyperpyrexia. This boy immediately after his fatal convulsion had a temperature of 108.4.

9. Rosenow and Tovell suggest that this phenomenon may be due to a neurotoxin produced by streptococci which in the course of general anesthesia produce these convulsions.

Symptoms

The premonitory symptoms of this condition are always the same, and consequently should be a helpful guide in instituting early treatment.

Woolmer and Taylor reporting four cases in 1936 said, "The patient is a child or young adult with pyrexia, usually due to some septic condition. The theatre is over-heated. Atropine has been given and the dose may have been excessive. The patient is deeply anesthetized with ether, the pupils being dilated and inactive to light. The color is, as a rule, good and oxygenated ether is sometimes being given. The eyelids start to twitch, then the face, and the convulsions become general. In the immediately fatal cases after 5 to 10 minutes of convulsions, the respiration ceases, the patient goes blue, and the heart stops; in other cases, the convulsions stop, but the patient dies later from cardiac failure; alternatively, recovery may follow the cessation of convulsions."

In the non-fatal cases there is a tendency for the convulsions to cease in fifteen to twenty minutes. After the patient has returned to bed there may be a continuance of convulsions.

Treatment

The etiology of this phenomenon is certainly far from being settled; however, from the work that has been done, and a study of the literature, it is apparent that certain procedures are available to anesthetists and surgeons which, when properly used, may prevent a catastrophe.

CONVULSIONS IN CHILDREN—WYATT

TABLE I. SUGGESTED PRE-OPERATIVE MEDICATION

Age	Morphine	Atropine
18-15	1/8 gr.	1/200 gr.
15-12	1/12 gr.	1/300 gr.
12-9	1/16 gr.	1/400 gr.
9-6	1/20 gr.	1/500 gr.
6-3	1/24 gr.	1/600 gr.

Since these fatalities are becoming more common it is probably advisable that a soluble barbiturate be at hand for instant use whenever a child is being operated upon for an acute septic process, under deep anesthesia. This substance should be given intravenously at once if the patient shows any twitchings of the eyelids or about the mouth.

Wright, for a twelve-year-old boy, gave 3 gr. of nembutal in 10 per cent solution intravenously slowly, and convulsions ceased abruptly.

Knight believes that a short-acting barbiturate such as evipal soluble or pentothal sodium should be given at first, and that if convulsions tend to recur, nembutal or sodium amytal can be used for sustained action.

The British surgeons have demonstrated that chloroform inhalations will frequently control the convulsions; hence a can of chloroform should be in every operating room when a child is being operated for an acute septic process.

Oxygen is present in every well equipped operating room, ready for instant use, and should be given at once.

Cold should be immediately applied to the body and ice over the carotid regions.

Jackson advocates use of calcium gluconate in one grain dosage to check hyperirritability of the nervous system.

Adrenalin, which is an antiallergic, should be given at once. Adrenalin also mobilizes the glycogen reserve.

Sears reported a case in which convulsions ceased coincident with intravenous injection of 50 per cent dextrose, and suggested that the condition might be associated with hypoglycemia in children.

Gwathmey feels that we must be more careful in our preoperative medication and anesthetic agent.

I feel that our dosage of atropine should be regulated more carefully, particularly in hot weather, in view of the fact that the British report most of their cases occurring in hot weather.

TABLE II. TABLE DEVISED BY B. C. LEECH, REGINA, SASK., CANADA

Age	Morphine	Hyoscin
Up to 6 mo.....		1/1200 gr.
6 mo.-1 yr.....		1/900 gr.
1-2 yrs.	1/40 gr.	1/600 gr.
2-4 yrs.	1/32 gr.	1/600 gr.
4-8 yrs.	1/20 gr.	1/450 gr.
8-12 yrs.	1/16 gr.	1/450 gr.
12-16 yrs.	1/12 gr.	1/300 gr.

To be given by hypodermic injection forty-five to thirty minutes preoperatively.

Discussion

I feel that in order to attain still higher levels of safety in our surgical work upon children we must give some critical thought to our preoperative medication, anesthetists, and anesthesia.

In considering preoperative medication perhaps some changes are necessary in order to attain greater safety. Atropine has been routine in preoperative medication for a good many years and has become almost as well established as morphine. We should at least give smaller doses of atropine and I'm not so sure but that it should be dropped from our preoperative preparation when we are operating upon children for an acute septic process. Many of us have seen atropine cause a sharp temperature rise in children and perhaps therefore make them more susceptible to convulsions. Haggard, in his experimental work, proved that a rise in body temperature lowers the alveolar CO₂ tension and reduces the amount of CO₂ in solution in the blood. Since realizing that atropine occasionally causes these disturbances I have stopped using it and our anesthetists report that it does not make the administration of ether any more difficult. As far as I can tell, the anesthesia is as smooth without the atropine as it is with it.

With the twitchings, severe carpo-pedal spasms, and convulsions that these children have, perhaps a calcium disturbance plays some rôle in this picture. I wonder if calcium gluconate should be given intravenously thirty to forty-five minutes preoperatively. Personally I intend to discontinue the use of atropine until further investigative work has been done regarding it in respect to convulsions while under general anesthesia.

I think we must all plead guilty to having paid too little attention to our anesthetist and the type

of anesthesia being used. Our anesthetist must be more than just an anesthetist. He or she must understand children, be skillful in the administration of anesthetics to children, and be able to handle any emergency that may arise during the course of the anesthesia.

Henderson, from his vast amount of research work on respiration, tells us that the first principle of anesthesia is that the depth should be maintained as nearly uniform as possible. Depth should be attained as quickly as possible and the stage of excitement be as short as possible.

The disturbance of the CO_2 capacity of the blood under ether anesthesia appears to be wholly dependent on disturbance of respiration. If the anesthesia is managed so that the respiration is but little increased, the lowering of the CO_2 content of the blood is slight. Ether hyperpnea, however, causes a very great reduction in the CO_2 content of the blood and danger of an alkalosis. Light etherization loses this influence when administered with sufficient CO_2 to maintain the alveolar CO_2 at a normal level.

The supply of oxygen has relatively little immediate influence upon respiration. The administration of pure oxygen never acts as a stimulant. CO_2 , on the other hand, is the normal stimulant and regulator of breathing.

In quoting these facts from Henderson's work on respiration I hope to call your attention to the growing importance of the work which is being done in the field of anesthesia and to re-

emphasize the important rôle that anesthetics play in our work with children.

I believe we must be cognizant of these advances if we are going to bring greater safety to our patients during surgical procedures.

Conclusions

1. Convulsions under ether anesthesia are so unexpected and terrifying that we must have a definite plan of treatment agreed upon between anesthetist and surgeon.

2. Check temperature before anesthesia is started.

3. Adrenalin must be given instantly.

4. Soluble barbiturate must be on hand for instant use, whenever a child is being operated for an acute septic process.

5. Ether anesthesia must be stopped at once on appearance of premonitory symptoms.

6. Chloroform, oxygen, and carbon-dioxide must be readily available.

7. Calcium gluconate or dextrose (50 per cent intravenously) may be necessary to stop convulsions.

I have taken the liberty of calling this condition to your attention because of the fact that this phenomenon is on the increase and every individual who has anything to do with operative conditions in children must be prepared to meet this emergency.

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INFLAMMATORY DISEASE OF THE THYROID GLAND*

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INFLAMMATORY disease of the thyroid gland can be defined as the resulting change in glandular structure produced by the action of a chemical, mechanical, or infectious process. It is characterized by lymphocytic invasion, and connective tissue proliferation, as well as other variable factors. Medical literature is filled with many excellent works pertaining to the various types of inflammatory diseases of the thyroid and their multitudinous phases. Such conditions become interesting, primarily because of the in-

frequency of their occurrence, the outstanding difficulty in recognizing them clinically, and finally because of the distinctive histological findings.

A logical classification of these conditions, Table I, will divide them into two groups with entirely different etiological factors. The first group consists of those cases in which the etiological factor is of a specific nature, while in the second group the reverse is true. Specific inflammatory disease of the thyroid includes tuberculosis, syphilis, actinomycosis, and echinococcus. All of these conditions are extremely rare

*Read at the annual meeting of the Northern Minnesota Medical Association, Detroit Lakes, Minn., September 8 and 9, 1939.

TABLE I. INFLAMMATORY CONDITIONS OF THE THYROID GLAND.

Specific:

1. Tuberculosis
2. Syphilis
3. Actinomycosis
4. Echinococcus

Non-specific:

1. Thyroiditis:
 - A. Acute
 - a. Without abscess formation
 - b. With abscess formation
 - B. Chronic
2. Riedel's struma
3. Hashimoto's struma
4. Strumitis
5. Lymphocytosis and fibrosis (slight to moderate)

and proven cases are still reported in the literature according to the total number found and published. It is not within the scope of this paper to give these conditions detailed consideration, but rather to briefly mention them and state their outstanding characteristics.

Tuberculosis of the thyroid is rarely if ever diagnosed preoperatively. Usually there is no clinical evidence of tuberculosis elsewhere, though the type of thyroid associated with miliary tuberculosis should be mentioned. In the classical case there is usually a diffusely enlarged gland causing pressure symptoms and characterized by a hardness and firmness which at times may be almost stony in character. The ordinary symptoms of thyrotoxicosis are often present *i. e.*, nervousness, irritability, tachycardia, dyspnea, and loss of weight and strength. Pathological examination of the gland shows a diffuse fibrosis with tubercle and giant cell formation and round cell infiltration. Attention should be drawn to the fact that a considerable number of thyroid glands removed surgically show tubercle and giant cell formation without any evidence of tuberculosis elsewhere in the body. Most of these cases contain no demonstrable tubercle bacilli and cannot be considered as tuberculosis. Thyroidectomy in this group as well as in true tuberculosis serves to alleviate the symptoms from which the patient sought relief. Histological and bacteriological studies of the gland removed at operation are essential before a final diagnosis can be made.

Syphilis, causing localized symptoms in the thyroid, is very infrequent. It is quite generally conceded by some authors that the thyroid is more resistant to this infection than other tissues of the body. Involvement of the thyroid may be found associated with secondary manifestations

of the disease. It is characterized by a diffusely swollen, markedly congested, painful gland. The localized condition yields readily to the usual antiluetic treatment. Syphilis may be characterized by gumma in the thyroid both in early or late stages. Microscopically the gumma shows the usual necrotic center surrounded by fibrous tissue invaded with lymphocytes and rather rarely giant cells.

Actinomycosis and echinococcus cysts in the thyroid are mentioned only because of their extreme rarity. It is unusual for these to be found by an average medical practitioner during his span of life, and little in regard to them can be found among medical writings. The diagnosis is not made clinically but entirely from a pathologic standpoint.

The present study is primarily concerned with the non-specific types of inflammatory disease of the thyroid. These include acute thyroiditis, acute thyroiditis with abscess formation, chronic thyroiditis, Riedel's struma, Hashimoto's disease (struma lymphomatosa), chronic strumitis, and lastly the frequent microscopic finding in a large percentage of goiters removed in which a mild degree of connective tissue proliferation and lymphocytic invasion exists.

Acute thyroiditis without abscess formation frequently follows acute infections elsewhere in the body. Such conditions as abscessed teeth, acute tonsillitis, and acute upper respiratory tract infection being the most common. Tenderness and swelling of the thyroid is present and is accompanied occasionally by dysphagia and usually by low grade fever. McQuillan states that the involvement of the thyroid may be localized or diffuse. At some period during the acute process varied manifestations of low grade hyperthyroidism may develop with metabolisms ranging as high as +30. Usually this condition is self limited and treatment with rest, salicylates, iodine, and heat is sufficient to promote a gradual diminution in symptoms. However, if response to this treatment is lacking, partial thyroidectomy should be done. Occasional myxedema follows acute thyroiditis.

Acute thyroiditis with abscess formation is a considerably more difficult and delicate therapeutic problem. Hertzler emphasizes the "terrible viciousness" that this form may attain. It may occur either in a normal or goitrous gland and like the non-suppurative forms, it frequent-

ly follows acute infections elsewhere in the body. Treatment consists in adequate drainage through proper exposure as soon as the diagnosis can be established. A common error is the failure to establish adequate drainage which frequently necessitates further operation.

Chronic thyroiditis may be defined as an inflammatory process of low grade involving the thyroid gland. It is recognized usually post-operatively from a histological examination of the specimen removed. Culture of the specimen characteristically is negative and shows no bacterial invasion. In a study of 100 cases, Wallis divided them into three groups; (1) those having ordinary signs of goiter without thyrotoxicosis or inflammatory process; (2) those having low grade signs of inflammation such as recent swelling and tenderness; and (3) those where symptoms of thyrotoxicosis are predominant. There seems to be a definite predisposition in women as his series showed a predominance of 85 per cent. The pathological findings vary from a marked lymphocytic infiltration with connective tissue proliferation and destruction of thyroid follicles to the more moderate forms which may not be deemed of sufficient importance by the pathologist to be worthy of mention as thyroiditis. In these chronic types, the evidence points to an infectious or mechanical source as the etiological factor but, as stated previously, culture of the specimens is almost always negative. The treatment is essentially surgical, partial thyroidectomy being the operative procedure of choice. Hypothyroidism of varying degrees may result and is dependent both on the severity of the inflammatory process and the amount of thyroid tissue left intact by the operator. Eberts and Fitzgerald differentiate chronic infectious processes in the thyroid according to the presence or absence of goiter. When the lymphocytic infiltration involves one or more nodules, they feel that it should properly be called strumitis in contrast to thyroiditis which is found only in what was apparently a previously normal thyroid. The microscopic evidence of inflammatory process is essentially the same whether found in goitrous or non-goitrous tissue and its treatment the same. However, it is a quite generally accepted view that goiter predisposes to inflammatory conditions in the thyroid and that the susceptibility is definitely greater than that of the normal gland.

Granting that this conception of differentiation of the diagnoses is correct, then obviously many diagnoses of chronic thyroiditis which have been made should have been chronic strumitis.

In 1896, Riedel first reported in the literature two cases of unusually severe inflammatory disease of the thyroid, since known as Riedel's struma. The two cases reported showed extreme induration and fixation of the gland. At operation extra capsular extension, marked adhesions to surrounding structures, and actual infiltration of vessels was found. Since this time, other cases have been reported from time to time, but definite, pathologically proven cases still remain a rarity. In 1936, Lee reported ninety cases of proven Riedel's struma culled from the literature and commented on the differential diagnosis. The condition is usually found in young to middle aged adults, the sex about equally divided, though some authors feel that there is some predisposition to this condition in the female. About 35 per cent give a history of pre-existing goiter. The disease may be unilateral or bilateral, the region involved varying from the size of a pea to the entire thyroid and surrounding structures. Clinically, a diagnosis of malignancy is made in about 90 per cent of cases. Usually these cases are characterized by dysphagia, dysphonia, swelling, and tenderness, with occasional symptoms of mild hyperthyroidism. The average metabolism in the series reported by Eisen was +10. Treatment is universally surgical and has varied from biopsy to partial thyroidectomy though the latter should be done where possible. The color of the gland varies from yellow to gray to pink. A histological study shows infiltration with lymphocytes and marked connective tissue proliferation with hyalinization. Pseudo-giant cells are usually present and may frequently be seen ingesting colloid material. A marked destruction of acini is quite apparent. Relief from surgical treatment is quite constant but according to various authors hypothyroidism follows in from 20 to 40 per cent of cases.

In 1912, Hashimoto reported four cases of diffuse lymphocytic infiltration of the thyroid. This became known as struma lymphomatosa and was at first considered a stage or form of Riedel's struma. Recent writers on this subject, however, agree that this is not the case, and that it exists as a distinct clinical and pathological entity. Graham in 1937, established its in-

THYROID GLAND—YOUNG

TABLE II. DIAGNOSES IN 26 CASES OF INFLAMMATORY DISEASE OF THE THYROID FOUND IN 2900 THYROIDECTOMIES.

(16 patients operated upon)

	No. Cases	Operated	Not Operated
Chronic thyroiditis	12	8	4
Acute thyroiditis	7	3	4
Abscess of thyroid	4	3	1
Tuberculosis of thyroid	1	Post	
Riedel's struma	1	1	
Hashimoto's struma	1	1	

dividuality by clearly differentiating the clinical and pathological findings. Briefly this condition is found 100 per cent in the female and in middle aged or old adults. It is always a bilateral diffuse involvement of the thyroid from

the literature available failed to show any attention to this type of chronic inflammatory condition. It may occur to varying degrees in normal glands, diffuse, or diffuse toxic goiters, and in nodular, or nodular toxic goiters. The gland of this type usually has a slight to moderate infiltration with lymphocytes and slight to moderate connective tissue proliferation. Associated with it are occasional colloid changes such as variation in staining qualities and various degrees of vacuolization. Pathologists' reports vary as to their recognition of this condition and as to the emphasis they place upon it. It is usually not present in sufficient amounts to be classified as a thyroiditis or strumitis, but rather as coin-

TABLE III. DETAIL REGARDING 26 CASES OF NON-SPECIFIC INFLAMMATORY DISEASE OF THE THYROID

	Acute Thyroiditis	Chronic Thyroiditis	Abscess	Riedel's Struma	Hashimoto's Struma
Average age	46.2	49	16.2	56	49
Males	1	4	2	1	0
Females	6	8	2	0	1
Acute infection preceding	3	0	1	0	
Average duration	35 days	195 days	7.2 days	60 days	15 days
Operation	3	8	4	1	1
X-ray	0	2	0	0	0
Medical treatment	4	2	0	0	0
Pain	2	3	4	1	1
Tenderness	2	3	4	1	0
Swelling	2	2	4	1	1
Pressure	2	3	3	1	0
Toxic symptoms	2	3	0	1	0

the onset. The duration of symptoms varies from one to two years, and about 20 per cent show evidence of hyperthyroidism. Seventy-five per cent of these cases develop hypothyroidism postoperatively and it is occasionally found before operation. In contrast to Riedel's struma there is no involvement of adjacent structures adding to the technical difficulties of the operation. Pathologically the most prominent feature is a diffuse lymphocytic infiltration with formation of lymphoid follicles having active germinal centers. There is also an increase in connective tissue which seems to be a replacement fibrosis. However, this is much less in quantity and more delicate in formation than in Riedel's struma. The acini show considerable degeneration and crowding out by the lymphocytic infiltration.

The last group which should be emphasized receives scanty consideration in the literature and is usually mentioned by pathologists only as an incidental finding. These cases are found in vast numbers in operative specimens diagnosed solely as some type of goiter. Careful search of

cidental and having no particular significance. The frequency of this finding in goiters where no clinical evidence of inflammatory process existed leads to speculation as to the possibility that this pathological evidence of low grade inflammation may be a primary causative factor

TABLE IV. PATHOLOGIC FINDINGS IN 16 CASES OF INFLAMMATION OF THE THYROID.

	Acute Thyroiditis	Chronic Thyroiditis	Riedel's Struma	Hashimoto's Struma
Lymphocytic infiltration ...	3	9	1	1
C. T. proliferation ...	3	8	1	1
Giant cells ...	1	3	1	1
Tubercles	1	0	0	0
Epithelial degeneration ...	1	0	0	0
Destruction of acini	1	5	1	1

in bringing the patient to the point of seeking relief. It is difficult to offer definite proof that this low grade condition should assume more importance in our clinical and pathological analysis.

However, a follow-up of a considerable group of these cases revealed a high percentage of cures, indicating that a possible relationship existed between these findings and low grade toxicity.

It is the belief of the writer that pathologists

Hospital, the following terminology was agreed upon as conveying to the surgeon or internist a concise understandable diagnosis. For example, such a diagnosis might read: Nodular Goiter with Hyperplasia II, Lymphocytosis II,

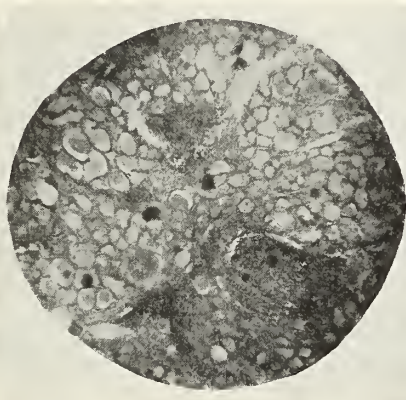


Fig. 1. Chronic thyroiditis showing marked connective tissue proliferation with hyalinization and extensive destruction of acini.

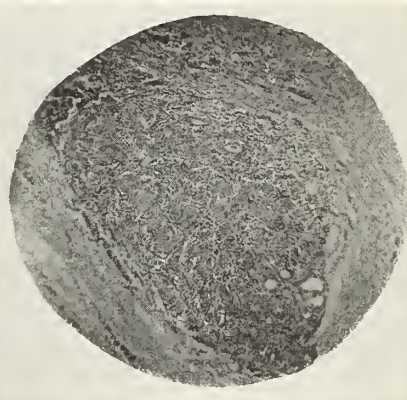


Fig. 2. Acute thyroiditis. Quite marked lymphocytic invasion with crowding out of thyroid follicles.

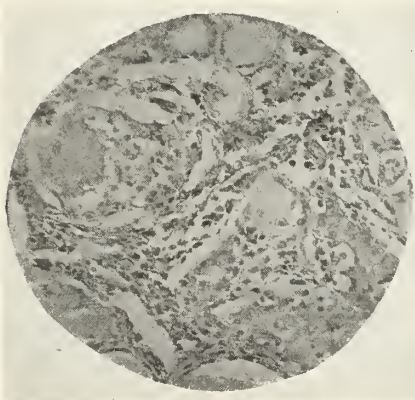


Fig. 3. Moderate degree of lymphocytic infiltration and connective tissue proliferation in low grade diffuse toxic goiter. This finding is quite universally disregarded.

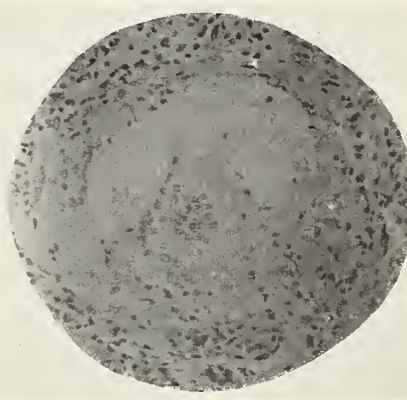


Fig. 4. Giant cell, ingesting colloid, surrounded by dense fibrous tissue.

should make a definite effort to include this finding in their report and that some term defining such a finding and having diagnostic significance should be used. Obviously they should not be called thyroiditis or strumitis, as these terms are applied to the more extensive and severe forms. The terminology used should be brief and to the point and convey a definite, understandable picture of the pathology found. Considerable thought and study have been given to devising a diagnostic terminology which would fill all the above qualifications. After discussion with Dr. Arthur H. Wells, pathologist at St. Luke's

Fibrosis I, or Diffuse Goiter with Hyperplasia IV, Lymphocytosis I, Fibrosis II. The value of the additional information conveyed should induce pathologists, surgeons, and internists to consider the advisability of using a uniform terminology of this or similar nature.

In addition to a review of the literature a study was made of all cases diagnosed as some form of inflammatory disease of the thyroid at St. Luke's and St. Mary's Hospitals during the past fifteen years. In this period 2,900 thyroidectomies were performed and out of this group only twenty-six cases or 0.8 per cent

were diagnosed as inflammatory lesions. In this series ten were diagnosed as chronic thyroiditis; seven, acute thyroiditis; four, abscess of the thyroid; one, tuberculosis of the thyroid; and one each of Riedel's and Hashimoto's struma.

plained of choking and two had fever. The pathological specimens both showed lymphocytosis and fibrosis, and one contained giant cells, tubercles, and showed epithelioid degeneration.

There were four cases of abscess of the

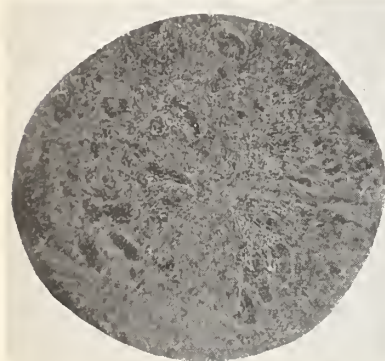


Fig. 5. Riedel's struma. Almost total destruction of thyroid acini by dense proliferating hyalinized connective tissue.

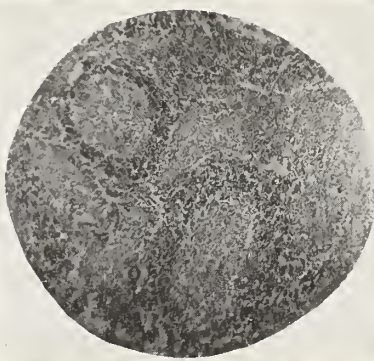


Fig. 6. Hashimoto's disease. Dense severe lymphocytic invasion with practically total obliteration of thyroid tissue. Formation of germinal centers is evident.

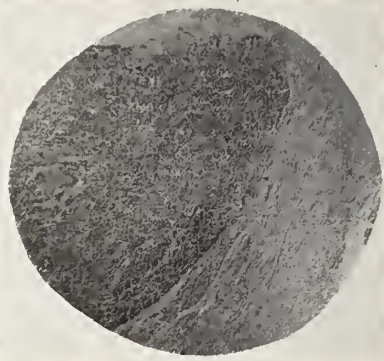


Fig. 7. Postmortem thyroid with total weight of 10 grams. Almost complete destruction of acini. Lymphocytic invasion. Connective tissue proliferation and deposit of fat globules.

There were seventeen females and nine males in the group. Sixteen patients were operated upon, two treated by x-ray, and the remainder were given medical treatment.

A brief résumé of the findings according to the type of pathologic lesions found was of interest. Of the twelve cases of chronic thyroiditis eight were females and four males with an average age of forty-nine. The average duration of symptoms, as was to be expected, was long and amounted to 195 days. In this group thyroidectomy was performed in eight cases, x-ray treatment in two, and two were treated medically. There was no history of preceding acute infection. The symptoms were quite evenly divided, the predominate ones being pain, pressure, tenderness, enlarged thyroid with mild symptoms of toxic goiter. Of the eight specimens removed all showed fibrosis and lymphocytic infiltration, three showed giant cell formation, and two definite destruction of the acini.

Seven cases were diagnosed as acute thyroiditis, six being females and one male. The average age was forty-six years and the duration of symptoms thirty-five days. An acute infectious process preceded the onset in three instances: one, impetigo; one, acute tonsillitis; and one, acute upper respiratory infection. The predominate symptoms were pain, swelling, and symptoms of thyrotoxicosis, while two com-

plained of choking and two had fever. The pathological specimens both showed lymphocytosis and fibrosis, and one contained giant cells, tubercles, and showed epithelioid degeneration. There were four cases of abscess of the thyroid: two male and two female with an average age of sixteen years. One patient had an abscessed tooth the week preceding. The average duration of symptoms was seven days while those most predominate were pain, tenderness, localized swelling and temperature. All cases were treated by incision and drainage followed by hot boric packs. One case was drained four times, one two, and the others one each.

There was one case of Riedel's struma in a male, aged fifty-six. Symptoms had been present for two months and consisted of hoarseness, difficulty in swallowing, definite diffuse enlargement of the neck, accompanied by symptoms of early thyrotoxicosis. At operation infiltration into surrounding structures was found to be present to a moderate degree. The specimen showed markedly severe connective tissue proliferation with hyalinization and destruction of acini. There were many atrophic follicles, and the presence of giant cells was noted.

The case of Hashimoto's struma (struma lymphomatosa) was a female, aged forty-nine, with symptoms of swelling of the neck, slight dysphagia, tenderness and pain present for about one year. The metabolism reading was —16. At operation a diffusely enlarged thyroid was removed without difficulty. The specimen showed moderate connective tissue proliferation,

marked lymphocytic infiltration throughout with germinal centers, giant cells and tremendous destruction of acini. The metabolism six months later had dropped to —36.

The case of tuberculosis in a male, age nine, was diagnosed by autopsy specimen in a patient dying from pulmonary tuberculosis. There was no suspicion before death that the thyroid was involved but pathological specimen showed giant cells, tubercles, and tubercle bacilli.

Another autopsy specimen is worth briefly reporting at this time. A male, age sixty-one, weighing 350 pounds, was brought to the hospital with acute heart failure and died in three hours. In this case the thyroid was removed in toto and weighed 10 grams. Microscopic sections showed marked acinar destruction and replacement with fibrous tissue and infiltrating lymphocytes. Only scraps of colloid could still be found. The additional meager data of tremendous weight, heart failure and undoubtedly marked hypothyroidism definitely classify this case as a severe chronic thyroiditis.

Conclusions.—A review of the literature and twenty-six cases of recognized inflammatory diseases of the thyroid emphasizes the infrequency with which such conditions occur and that the most successful treatment in the majority of cases is surgical. The importance of recognizing evidence of primary or secondary inflammatory processes of lesser degree occurring in all types of goiter is emphasized and a concise manner of reporting pathological diagnoses including these inflammatory changes suggested.

Summary

Twenty-six cases of inflammatory disease of the thyroid occurring in 2,900 consecutive thy-

roidectomies have been reviewed and important points of diagnosis emphasized. Sixteen of these patients were treated surgically, two by x-ray, and eight by medical management. Two autopsy specimens were included in the eight treated medically. Results in those treated surgically were good. There was a high percentage of hypothyroidism in this group, as was to be expected.

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CRITICAL CREOSOTE CRITERIA

The report of the Council on Pharmacy and Chemistry of the American Medical Association (J.A.M.A., 110:209, Jan. 15, 1938) indicated that creosote and its allied preparations have received more promotion and widespread application in the past than is warranted by the available pharmacologic evidence. The Council therefore omitted all such preparations from New and Non-official Remedies because they are marketed without satisfactory evidence that they have sufficient therapeutic value and their use is based entirely on empiricism. E. J. Fellows, who previously reported three studies of a series, now reports a critical study of the effect of orally administered calcium creosotate on the twenty-four hour sputum of patients with pulmonary tuberculosis. In spite of the fact that estimations of the volatile phenols excreted in the urine of patients who received the highest oral doses of the drug indicated

adequate absorption, significant change in either the sputum phenols or sputum volumes was not observed in any of the cases during the period of calcium creosotate administration. The author also investigated the expired air of animals given the drug. Observations on six rabbits revealed that phenolic material was not present in their expired air during a period of eight to eighteen hours after each animal had been given 0.5 Gm. of water-soluble calcium creosotate phenols by stomach tube. The results of the entire study not only invalidate the reports of other workers who attempted to establish a rationale for creosote compounds in pulmonary disorders on the basis of change in the expired air during administration of such drugs but also disprove previous claims for symptomatic relief because of the increase in expectoration and appetite or lessening of cough. (J.A.M.A., Nov. 11, 1939, p. 1815.)

NASAL OBSTRUCTION: IS IT ALLERGIC?*

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THE ever widening field of medicine and surgery today makes it imperative for many to limit their knowledge to special regions of the body. Increasing application of this knowledge tends to enlarge the field of each specialty. This makes it necessary to have a more thorough understanding of phenomena which may have local manifestations, and in addition may affect remote regions of the body. This is never more true than in the field of allergy. No specialty is exempt from its capricious effects, and thus no specialist can afford to disregard its presence, but should acquire some knowledge of its etiology, diagnosis, and treatment. To the general man whose daily work touches upon all fields of medicine and surgery, it adds one more link to his ever widening horizon. The pendulum must not swing too far, however, for if it does, we may develop an allergic phobia which may prevent the proper treatment in a given surgical or medical case.

Affecting as it does every field of medicine, we, who limit ourselves to a specialty, feel justified in calling to your attention certain characteristics of this phenomenon as it affects our particular field, which may render clues to the proper treatment of corresponding conditions in other fields. The purpose of this paper is not to attempt to bring anything new into this already complex field of allergy, but to emphasize the fact that the cases of nasal obstruction you see may be allergic. The time is not far distant, we believe, when every case of nasal obstruction, either acute or chronic, should be declared guilty of allergic tendencies until proved innocent. This thought is not any more radical than the emphasis placed upon every bellyache as being one of an acute appendicitis until proved otherwise. For the purposes of this paper, when we refer to nasal obstruction, we mean to imply an obstruction of any degree and of sufficient moment to bring the patient to see you about its correction, or of sufficient moment to cause comment by the patient of its presence. When we refer

to allergy as it affects the nose, we are not referring just to seasonal hayfever, but to its many manifestations in the nasal structure.

The term allergy as used in the scientific sense is full of controversial meanings. As we are interested primarily in one clinical phase, we like the definition of the term as given by Ellis² in which he states that "allergy indicates a constitutional state whereby an individual reacts specifically and exhibits characteristic symptoms in response to substances which to normal individuals in like amounts are harmless and innocuous." Allergy and the term hypersensitiveness are used synonymously in clinical medicine, and rightly so, but they should not be confused with the term intolerance. The latter term, according to Ellis² "is used to designate the state or condition of an individual who responds to ordinary amounts of a substance in an exaggerated manner, but without characteristically different symptoms or physiological effects." To understand the reaction in allergic manifestations, the concept of the shock organ and shock tissue is necessary. It brings about a better understanding of the production of diverse conditions such as hayfever, asthma, eczema, urticaria, angioneurotic edema, allergic rhinitis, gastro-intestinal disturbances, and in many instances migraine, from contact with one and the same allergen. "Concerning shock tissue we have much to learn. That it is the same in anaphylaxis in animals and clinical allergy is extremely doubtful. In anaphylaxis, it appears to be chiefly, if not entirely, smooth muscle tissue—in the case of human allergy, the reaction in most of the major phenomena is almost always edema and not a result of smooth muscle contraction." "The anatomical location of the sensitized cells or shock tissues then determines the symptomatology of an allergic reaction."² If it is located in the nose, we will have manifestations of which hayfever is an example; if in the lungs, asthma; in the skin, eczema or urticaria, etc. Thus when we have symptoms referable to the nose, and of these symptoms nasal obstruction

*Read at the annual meeting of the Northern Minnesota Medical Association, Detroit Lakes, Minnesota, September 8, 1939.

is paramount, it is very important to determine with every means at our command whether the basis of the findings is due: (1) to the presence of shock tissue with its attendant reaction which we call allergic; (2) to an infectious agent; (3) to anatomical abnormalities; (4) to glandular or vitamin disturbances; or (5) to normal physiologic response to varying environmental changes.

It is important to emphasize some physiological facts concerning the nose as they relate to this symptom of nasal obstruction. Patients coming to you complaining of this symptom do not necessarily have pathological processes causing them. To many, the nose may or may not be a thing of beauty, but to all a well functioning nose is a blessing. It must have a perfectly adaptable mechanism, when you realize that it is the only organ of the body that cannot be adequately protected from the environmental surroundings in which it performs its functions. These are four-fold: to filter, to moisten, and to warm the inspired air, and lastly to smell. The efficient performance of these processes depends chiefly on the function of the vasomotor mechanism. What are some of the physiological responses of the nose which may be interpreted by the laity, and also by many doctors, as nasal obstruction? These are described fully by Lillie in a recent article.⁶ Briefly, allow me to indicate a few. We all know that the nasal cavity is divided by the septum, but we forget that it is scarcely ever straight. The importance then of a deviated septum lies in its effect on the nasal function. This was brought sharply to my attention quite early in my practice when, with the assuredness that comes only with recent completion of one's medical education, I would, after inspection of a nose with a bad deflection, state, "You must have considerable difficulty in breathing through your nose?" In the majority of cases the answer would be, "Not at all." Confidently, I would inspect another nose which, intranasally looked fairly normal, and then I would venture the statement, "Surely you have no trouble with your nose?" The answer would come back, "Doctor, I have a lot of trouble breathing. The nose is blocked most of the time." I soon learned to make my examinations with no comment, but would wait for a voluntary declaration from the patient. The point is, I was looking at the nose from an anatomical

standpoint, and not from a physiological one. Increased knowledge of the physiology of the nose in the last quarter of a century has now placed rhinology upon a more scientific basis. Many failures of intranasal operations can be traced to the fact that they were performed upon a strictly anatomic basis with no consequent relief of the patient's symptoms.

Another interesting point brought out by Lillie was the relationship of the erectile tissue of the nose and the sexual development of an individual.⁶ "It becomes clinically important that this be recognized, for it accounts for many of the so-called stuffy noses so often seen in adolescence and newly married couples." He also calls your attention to the effect of the climate and other atmospheric changes. "In the variable, rugged climate of the Northwest with frequent changes in the weather, one might expect that the membrane of the upper part of the respiratory tract would become hypertrophic, whereas, in the warm, equable climate, where the nose is not required to function excessively, there might be very little change." You are all familiar with the patient who complains at night of obstruction on the side on which he is lying. As Lillie states,⁶ this is due to passive congestion from gravity and is a normal condition. One must be sure, however, before one dismisses the patient, that this physiological evaluation of one's findings is not aggravated by some pathological process. Thus in one's final conclusion as regards normal physiological properties of the nose, let it not be said of you, "Some to the fascination of a name, Surrender judgment hoodwink'd."¹¹

Confronted with a case of nasal obstruction, we apply our reasoning so as to either convict the case as one of allergy, or by our findings find it non-allergic in origin. Proceeding in this manner, we have personally found that fewer mistakes are made in diagnoses. In some minor cases, the diagnosis is self-evident and detailed procedures are not necessary. However, you who feel that you have very few cases of allergy in your practice have overlooked them by not proceeding along an orderly manner in examination and diagnosis. In our limited experience, we can conservatively state that 30 per cent of our nasal cases seen in routine private practice have local findings attributable to allergy, or are associated with other manifestations of it. There-

fore to institute therapy on a rational basis, one should complete the clinical history, the physical examination, and laboratory procedures. As Faulkner³ states, it may seem advisable to take a preliminary history, then make an examination of the nose, and if there is found a suspicion of allergy, a more complete history can be taken. In any event, the clinical history must be thorough and complete. This cannot be stressed too strongly, for in many atypical cases a positive family history aids in the diagnosis, whereas the examination and laboratory procedures may fail us. As Hansel⁴ emphasizes, every possible relationship of the symptoms to the etiologic factors and to the possible association of other manifestations of allergy must be considered. Thus, first, the family history is all-important. He found in about 70 per cent or more of all cases there is a history of the occurrence of various manifestations of allergy in the family. This is the one true and common foundation all allergists stand upon: namely, the hereditary factor. Secondly, the association of other manifestations of allergy in the past and present must be analyzed. Hansel⁴ found this association in approximately 70 to 75 per cent of all cases of nasal allergy. Thirdly, the nasal symptoms, and particularly as regards this discussion the symptom of nasal obstruction with its associated manifestations, should be thoroughly considered from the following standpoint:

1. The time of onset should be exactly determined, if possible, so as to better associate the symptoms with possible contacts with the offending substances. The characteristic features of the onset with the effect of occupation, environment, seasons, drugs, foods, acute infections, and the physiological changes accompanying the different stages of life upon it, must also be considered.

2. The course and nature of the symptom of nasal obstruction as to whether it is constant or intermittent must be studied. Thus an analysis of acute exacerbations or periods of relief must be taken into account.

3. The relation of the symptom under discussion to the seasons, time of day, home or foreign environment, sports, occupation, foods, climate, physical agents, previous nose and throat treatments, either surgical or medical, and the effect of other diseases or illnesses must be

taken into consideration. This indicates briefly the type of clinical history that should be taken.

As the main characteristic reaction of allergy is edema, we should naturally expect to find on physical examination varying stages of that state in the typical cases. This can vary from the simplest sign of edema, indicated by pallor and intumescence of the mucosa, to marked hypertrophic thickening and polyposis. These changes can also occur in infections. Therefore aside from obstructions, physiologically or anatomically produced, the differentiation in most cases must be made between allergy and infection. Hansel⁴ states that with the exception of acute infections, allergy is the most common affection of the nose and paranasal sinuses. In typical cases, the symptoms and findings are so classical that the diagnosis is perfectly evident. In atypical cases, however, the symptoms may be intermittent, simulating recurring attacks of acute rhinitis. Therefore, other aids in diagnosis must be called upon. One of these is cytology of the nasal secretions. This procedure has been promoted so strongly of late that it has led many to disparage its importance, and has led them to remark that the diagnosis of allergy is dependent chiefly upon the findings of cytology. The true diagnostician regards the findings of cytology in the same light that the surgeon views an increased leukocytic response in the presence of an acute belly. In other words, it indicates that something is going on, and spurs investigation. We believe that there would be fewer mistakes made in diagnosis if the cytologic findings were taken at their face value rather than scoffed at or disregarded. Hansel⁴ is one of many authorities who consider it highly diagnostic. He states that wherever the lesion of allergy occurs, it is characterized by edema and eosinophilic infiltration. The eosinophiles are found in the secretions upon microscopic examination, even when there may be no visible evidence of edema. The presence of eosinophiles in significant numbers is absolute evidence of the allergic process, he states. A persistent absence of eosinophiles, except in cases of marked complicating sup-puration, definitely excludes the possibility of allergy. During acute infections, the secretions may contain only neutrophils and a few or no eosinophiles. As the infection subsides, the neutrophils gradually disappear and the eosinophiles gradually reappear in increasing numbers,

the secretions finally becoming clear and watery or mucoid. With marked nasal obstruction, secondary infection of the stagnation type may occur in which the secretions show a considerable number of neutrophils as well as eosinophils. Upon restoration of nasal respiration, the neutrophils quickly disappear. By repeated cytologic observations over a prolonged period of time, it is possible to determine the exact incidence of infections in the allergic individual, and also to indicate whether true allergy is present. In other words, one microscopic examination is not sufficient, but many should be performed. Nasal obstruction is rarely an emergency matter, so careful observation and examination should be the rule.

Having completed the history and physical examination with the laboratory procedures thus far indicated, the skin tests should next be performed. Again allow me to emphasize that too much importance has been placed upon them by the members on the outer fringe. They have exaggerated the importance of them and have said, just as they did in the case of the cytologic procedure, that the diagnosis of allergy is based on the skin test findings. Now these skin tests are not infallible. Many positive reactions can occur with no clinical proof, and in addition there may be many clinical manifestations of allergy with negative skin tests. However, the information obtained should always be correlated with the clinical history, the physical findings, and the other laboratory procedures. "In the final analysis of the relationship of positive skin reactions to the clinical sensitiveness, it should be determined whether the patient has contact with the suspected substances and whether upon contact the symptoms are produced."⁵

As further aids in diagnosis, we can but mention, due to the limitation of time, the bac-

teriologic and radiographic procedures, the elimination diets, and the effect of the allergenic treatment upon the given condition.

It has not been the purpose of this paper to present the diagnosis and treatment of allergic nasal obstruction, but its scope has been centered on the thought that every nasal obstruction should be considered allergic until proved otherwise. The methods of procedure to determine this have been indicated.

Conclusions

1. Every case of nasal obstruction, either acute or chronic, should be considered allergic in origin until proven otherwise.
2. The known physiological facts concerning nasal function should be remembered in every case of nasal obstruction.
3. With the exception of acute infections, allergy is the most common affection of the nose and paranasal sinuses. This is important to remember in treating nasal obstruction in children. It explains many poor results obtained from tonsillectomy and adenoidectomy.
4. In investigating a case of nasal obstruction, the history, and physical examination with laboratory aids are just as important in making the diagnosis as the skin tests, the bacteriologic and radiographic examinations.
5. Eosinophilia is indicative of allergy, but not absolute proof of its presence.

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ABORTIFACIENT BARRED

On Jan. 21, 1939, Olaf M. Bornstad of Minneapolis was called on by the Post Office Department to show cause why the mails should not be closed to the "Bornocks Company," a trade style used by Bornstad in advertising and selling through the mails "Bornock's Tablet Treatment" as a means of producing abortion. Bornstad solicited business "by the use of newspaper advertisements" and letters. Mr. Bornstad waived a

hearing and indicated a willingness to have all mail addressed to his company returned to senders. On Feb. 15, 1939, the mails were closed to the Bornock's Company, and its officers and agents as such, because the business was a violation of statutes prohibiting the advertising and sale through the mails of any matter to be used for the purpose of producing abortion. (J.A. M.A., Oct. 21, 1939, p. 1583.)

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN HENNEPIN COUNTY

BY A. S. HAMILTON, M.D.

(Continued from January issue)

Hahnemann Medical Society of Hennepin County

Tribune Directory, 1873-1874:

"The Homeopathic Society was organized a few months ago under the name of Hahnemann Medical Society of Hennepin County. The officers are: W. H. Leonard, President; T. R. Huntington, Secretary and Treasurer. Meetings the first Friday of every month in the office of Drs. Goodwin and Flanders."

The following note of the Homeopathic Society is from *Neill's History of Hennepin County*:

"The Hahnemann Medical Society of Hennepin County was organized September 16, 1872, and was the result of an informal meeting of the Homeopathic physicians of the city held in Dr. W. H. Leonard's office September second of that year. A constitution and by-laws were adopted and signed by Drs. D. M. Goodwin, W. H. Leonard, G. F. Flanders, T. S. Huntington, M. H. Wallens, and Petrus Nelson. Dr. Huntington died in March, 1873. * * * * In May, 1880, a plan for a free dispensary was begun which resulted in the Cottage Hospital."

The latter statement would seem to have been an error, since the Cottage Hospital was opened early in March, 1871, and was due largely to the efforts and energy of Bishop Knickerbocker of the Brotherhood of Gethsemane, aided by Dr. Ames.

Davison's Directory, 1874: President, W. H. Leonard; Vice-president, G. F. Flanders; Secretary and Treasurer, P. Nelson.

Campbell's Directory, 1875: President, P. L. Hatch; Treasurer and Secretary, G. F. Flanders; Censors, Goodwin and Leonard.

Campbell's and Davison's Directory, 1876: President, D. M. Goodwin; Treasurer and Secretary, P. Nelson; Censors, Goodwin and Leonard.

Campbell's and Davison's Directory, 1877-1878: Officers same as before.

1878-1879: Officers same as before.

1879-1880: President, W. H. Leonard; Secretary and Treasurer, Miss Hutchinson.

Davison's Directory, 1880-1881: President, A. A. Camp; Treasurer and Secretary, S. P. Sterrett.

Davison's Directory, 1881-1882: President, A. A. Camp; Vice-president, Mary L. Swain; Secretary and Treasurer, Adele S. Hutchinson.

1882-1883: Officers same as before.

With this year the lists cease in the directories until 1893, when I have a record of the Hennepin County Medical Society, but nothing further of the Homeopathic Society.

Minneapolis Hospitals

As the COTTAGE HOSPITAL was the first private hospital to be opened in the Falls Cities, a further word as to its organization and development may not be out of place. The following items are taken largely from the *Daily Tribune*:

Daily Tribune of January 22, 1871:

"Through the kindness of Dr. A. E. Ames, the physician of the Brotherhood of Gethsemane, a dispensary has been opened in Dayton's Block by the Brotherhood for supplying the deserving poor with medicine and advice gratis. We hope this is preparatory to the opening of a hospital, an institution much needed in our city."

On Friday, March 3, 1871, the *Tribune* printed an editorial on "The New City Hospital," emphasizing its need, and giving something of its history:

"To come back to Minneapolis, the Brotherhood of Gethsemane, a benevolent institution believing that the time has come when in a population like that of the two Falls cities some provision should be made for the sick and maimed destitute, have taken the first decisive steps to that end by assuming the responsibility for providing a building for the purpose and, reckoning thereafter upon the benevolent promptings of our citizens to sustain the undertaking, they ask for money and a good attendance at Dr. Ames' lecture."

Then follows "The Appeal of the Brotherhood of Gethsemane in behalf of the Cottage Hospital." They had already secured a matron and received \$500 to furnish the building, rented temporarily on Washington Avenue beyond Bassett's Creek. Donations were to be sent to Messrs. Mendenhall and Westfall.

On March 7, the *Tribune* printed a letter from Rev. Knickerbocker in reference to the hospital, extending thanks, and adding:

"And now permit me to say a few words about the future of such a hospital. An institution like this in a large and prosperous community like Minneapolis and Saint Anthony should not be permitted to remain long in a rented and uncomfortable building. The time is not far distant when a medical faculty and a medical school must be connected with the rising University of Minnesota. A hospital is indispensable for such a school. Why shall this not grow into something of the kind? * * * * *

On March 9, a letter from A. E. Ames appears saying that there will be no contagious diseases admitted to the hospital, as the city itself already has a pest-house outside the city limits.

The Sunday, March 19, edition of the *Tribune* gives the following items under the heading,

"The New Hospital"

"The work of furnishing and preparing the hospital has been so far perfected as to admit of the reception of patients. Our citizens have responded generously to the call for aid in the enterprise. Already many useful donations of furniture and provisions have been made. Some eight beds have been provided, besides a good part of the general furniture of the house. The Masonic order has furnished a room comfortably. The employees of the Milwaukee car and machine shops a room. The Nicollet House, St. Mark's Parish, the Ladies' Aid of Gethsemane Church, the Brotherhood of Gethsemane, a lady of the Brotherhood of Gethsemane, and the millers each contributed the means to furnish a bed. The druggists have furnished a generous supply of medicine, the liquor merchants the necessary liquors, whilst several individuals have given general pledges of assistance. These will all be acknowledged in detail later. The bedding is all new and made up by the Ladies' Aid Society of Gethsemane Church. The first patient was received into the hospital on Tuesday [March 14], an orphan lad, eighteen years of age, without friends, of German parentage. He had been a newsboy on the Pacific Railroad and had been taken sick in a boarding house

without means of support. He expressed great gratitude for the comforts and attention of the home. A second patient was received on Thursday [March 16]. He was a Swede who lost a leg recently on the Milwaukee Railroad and was brought from Mendota. He, too, was overjoyed to get where he could receive proper care and attention. The third patient was received on Friday, a Norwegian, taken down in a bawdy house with pneumonia. He was brought to the hospital in filth and rags and was cleaned and made comfortable.

"Thus is the hospital meeting a great want in the community. It will no doubt soon be filled. It has a capacity of four more beds, which should be furnished at once. The working men of Minneapolis will take an interest in this home and contribute liberally to its support. It is the small contributions of the many that are asked to sustain it. . . .

"The government of the hospital is entrusted to the following persons: Superintendent, Rev. D. B. Knickerbocker; matron, Mrs. Mary A. Everts; physician and surgeon, Dr. A. E. Ames, with Drs. Goodwin and Linn as consulting physicians and Drs. Hutchinson and Hill as consulting surgeons; Treasurer, W. H. Chamberlain; Secretary, S. B. Cowdery; Directors, W. H. Greene, H. P. Westfall and R. J. Mendenhall. . . .

"Private patients can be accommodated and can have their own physicians visit them when they wish, as may also any beneficiaries."

The *Tribune* of April 2 contains an editorial urging a larger building, and on April 6 is found a notice of the first death in the hospital. The report of the hospital for May was as follows: Seven males and one female admitted. Four discharged, and one died. A note was made that during Dr. Ames' absence in California, attending a medical society, Dr. Linn had discharged the duties of medical attendant to the hospital.

The *Tribune Directory* of 1874-1875 gives the medical officers of the Cottage Hospital as follows: Drs. E. Phillips, A. Ortman, W. H. Leonard, and C. W. Putnam, attending and visiting physicians.

In 1876 (Campbell and Davison's *Directory*) the medical staff consisted of Drs. Phillips, Ortman, Leonard and Putnam, and in 1877, Dr. A. A. Camp was added. The staff remained the same in 1878 and 1879, but, in 1880, was changed to the following: Drs. Dunsmoor, Spaulding, Leonard, Putnam, and Camp. The 1881 staff comprised Drs. Dunsmoor, Wells, Abbott, Hamilton, Lawrence, Leonard and Camp.

BETHANY HOME was founded by the Sisterhood of St. Bethany in 1875, "for helping the tempted, saving the fallen, and restoring erring women to the right life." Mrs. T. B. Walker, who was secretary and later president of the Sisterhood, related in a report given to the organization just before her death in 1916, how a few women had become "somewhat disturbed by what they considered an unjust judgment of the court in sending four women to the State Penitentiary for immoral lives without making any effort to bring their male associates to judgment for the same offences. An appeal to the Governor brought the answer that if the sentence was remitted there would be no place for these women to go except back into their former lives. A house was rented, a matron provided and the four women received. But they soon rebelled against their position and, with their Bibles under their arms, walked out of this strange new home and pawning their Bibles for whiskey, were gloriously drunk and in the hands of the police before the morning of their first night of liberty."

For several years unmarried mothers were not admitted, for the founders felt that the public woman and the misled girl could not be associated together without injury to both. But in the course of the years the policy of the board changed and a maternity hospital developed and grew into the present Harriet Walker Hospital, named for the founder who served on its board for forty-one years and was also the first president of the Northwestern Hospital Board.

The MINNEAPOLIS FREE DISPENSARY was founded in 1878 by Hon. C. A.

Pillsbury, Geo. A. Brackett, C. M. Loring, A. B. Barton and E. S. Jones. It was intended to meet the necessities of a large class of deserving poor, who, while in need of medical assistance, were yet not subjects for hospital care. It was located at 208 Second Street South, where it remained until 1882, when it was incorporated into and became a department of the Minnesota College Hospital just established on the East Side in the building formerly known as the Winslow House.

Until 1881 the Cottage Hospital, whose name was changed to St. Barnabas in 1884, would seem to have been the only general hospital in Minneapolis, but in that and the following year there was a regular epidemic of hospitals, that of Dr. A. A. Ames being the second in the city. The directory of 1882-1883 contains this list of such institutions:

"Ames, A. A., Private Hospital, 4th Ave. So. and Washington.

"Cottage of the Brotherhood of Gethsemane, Cor. 9th Ave. So. and 6th St.

"Minn. College—Dr. L. C. Mitchell, Superintendent.

"Sisters of Mercy, 6th St. Cor. 25th Ave. So.

"Homeopathic—A. L. Bausman, Secretary."

The MINNESOTA COLLEGE HOSPITAL was established in 1881 in the large stone building well known at the time as Macalester College, formerly the Winslow House, on the corner of Bank and Second Streets, Southeast. In 1883 it was said to have a capacity of three hundred beds and was in charge of an able corps of physicians and nurses under the general direction of the board of trustees.

A HOMEOPATHIC HOSPITAL had recently been organized in 1883, when Richard Olding Beard compiled a Handbook of Minneapolis. Some fifty patients could be accommodated at their temporary quarters at the corner of Ninth Street and Eighth Avenue South. Its Hahnemann ward of ten beds was supported by the ladies of the city and in charge of female physicians. "The main hospital is under the care of competent homeopathic physicians."

According to Dr. Beard's Handbook of 1883, the SISTERS' HOSPITAL at 2416 Sixth Street South, under the management of the Sisters of Mercy, had a medical staff appointed by the sisters and provided care for seventy-five patients.

The NORTHWESTERN HOSPITAL was opened November 20, 1882, in a small rented house on Fourth Avenue South and Twenty-fifth Street. The organization meeting was held at the Friends Meeting House and Mrs. T. B. Walker was made president. Within a year the hospital was moved to a large house on Clinton Avenue, purchased for about \$3,000, and in 1887 a new building was completed at Chicago Avenue and Twenty-seventh Street, on land donated by Hon. L. M. Stewart, and still occupied by the present hospital buildings.

The institution was established in 1882, for the treatment of women and children, with a staff composed wholly of women: Drs. Mary G. Hood, Mary S. Whetstone, with Dr. Emily Fifield as resident physician. The consulting staff consisted of Drs. A. W. Abbott, H. H. Kimball, S. S. Whetstone, S. F. Hance, C. L. Wells, and A. H. Lindley.

The signers of the articles of incorporation included Drs. Annie T. Hass, Lizzie R. Hass, Mary G. Hood, and Mary S. Whetstone, along with a group of nine women headed by Mrs. Harriet G. Walker.

MATER MISERICORDIA HOSPITAL. In 1882, Mother Joseph, a Sister of Mercy from New Orleans, who was conducting a school in Anoka, purchased a tract of land on the west bank of the Mississippi, known as Murphy's Grove, a favorite picnic ground for the residents of the nearby towns of Saint Anthony and Minneapolis. The large frame house, home of the Murphy family, was taken over

by Mother Joseph and her companion, Sister Antonia, and opened as the first Catholic hospital in Minneapolis, the Mater Misericordia Hospital. The project was abandoned after a few years and the property bought by Bishop Ireland who turned it over to the Sisters of St. Joseph, who later opened St. Mary's Hospital there.

MATERNITY HOSPITAL was established in 1886 by Dr. Martha G. Ripley when she cared for three indigent maternity cases in a home on Fifteenth Street South. During the first year of its existence, thirty-seven women and thirty-two children were admitted.

The CITY HOSPITAL was organized by a resolution of the City Council passed July 1, 1887. In 1920, the name was changed to Minneapolis General Hospital. The following doctors have served as superintendents since its was established:

Dr. J. H. Dunn.....	July 1, 1887—July 1, 1888
Dr. Chas. A. Chase	July 1, 1888—Feb. 20, 1893
Dr. Chas. G. Weston	Feb. 20, 1893—July 1, 1899
Dr. Wm. J. Byrnes.....	July 1, 1899—July 1, 1901
Dr. Henry S. Nelson	July 1, 1901—July 1, 1903
Dr. George E. Ricker.....	July 1, 1903—July 1, 1905
Dr. Emil H. Beckman.....	July 1, 1905—July 1, 1907
Dr. Ole Linjar	July 1, 1907—Dec. 11, 1907
Dr. Peter M. Holl.....	Dec. 11, 1907—May 17, 1909
Dr. Archa E. Wilcox.....	May 17, 1909—July 20, 1909
Dr. Herbert O. Collins.....	July 20, 1909—July 16, 1918
Dr. Harry A. Britton.....	July 16, 1918—Dec. 15, 1919
Dr. J. M. Neal.....	Dec. 15, 1919—Jan. 20, 1920
Dr. Walter E. List.....	Jan. 20, 1920—Oct. 1, 1930
Dr. Chas. E. Remy.....	Oct. 1, 1930—July 31, 1937
Dr. F. E. Harrington, Acting Superintendent.....	July 31, 1937—Dec. 31, 1938
Dr. D. W. Pollard, Acting Superintendent.....	Jan. 1, 1939—to date

ST. MARY'S HOSPITAL was founded in 1887 by the Sisters of St. Joseph of Corondelet. Sister St. John Ireland, Superior of Holy Angels Academy, Minneapolis, was sent out to investigate the property vacated by the Sisters of Mercy after their brief tenure as the Misericordia Hospital, and found the old Murphy house entirely empty except for two straw bonnets such as were worn by the Sisters from New Orleans. Shortly, linen and supplies for the new mission were gathered at the Holy Angels Academy and in October, 1887, St. Mary's Hospital began its work in the old frame house. It could house twenty patients who had to be carried up and down the stairs. The attic was a ward; operations were performed on the table in the Sisters' dining room; water and instruments were sterilized in the kitchen; the Sisters ate from the pantry shelves and went without service of kitchen stove on operating days.

In 1890, the cornerstone was laid for a new four-story brick building, increasing the capacity to about one hundred. The school of nursing was formally opened in 1900.

The following physicians were the first in attendance at St. Mary's Hospital: A. W. Abbott, J. W. Bell, J. P. Barber, C. M. Cannon, J. H. Dunn, F. A. Dunsmoor, G. G. Eitel, Wm. A. Hall, P. M. Hall, R. J. Hill, W. A. Jones, J. W. Little, A. C. McCollom, J. E. Moore, L. A. Nippert, W. E. Rochford, C. J. Spratt, W. A. Spring, H. B. Sweetser.

Dr. J. H. Dunn was the first chief of staff, and his successors have been Drs. H. B. Sweetser (fifteen years), A. S. Hamilton, J. F. Corbett, J. M. Hayes, Leo Murphy, J. E. Hynes, M. J. Lynch, and Willard White.

The LUTHERAN DEACONESS HOME and HOSPITAL (1412 East 24th Street) began November 1, 1888, with a twelve-bed capacity in a small house at Hennepin Avenue and 27th Street with two years free of any rental charge. It was incorporated August 17, 1889, with Rev. M. F. Gjertsen, Prof. G. Sverdrup, Prof. S. Oftedal, and Frederick Laws, M.D., as the first board of trustees.

In 1891, a house and two lots on 23rd Street and Fifteenth Avenue South were purchased for \$5,500. The house was remodeled at a cost of \$3,500 to accommodate twenty-eight patients. At the time of the typhoid fever epidemic in 1892, a smaller building, consisting of two nine-bed wards, was erected at a cost of \$1,800 for the exclusive care of typhoid patients. In 1897, an adjoining lot with house was purchased for \$1,800 and in 1900 another house and lot added at a cost of \$1,600. These buildings provided hospital beds and homes for the deaconesses until the present modern hospital was erected in 1910.

Drs. Frederick Laws, Knut Hoegh, Jakob Hvoslef, and P. A. Aurness were the first attending physicians. In 1900, the medical staff was organized, with Dr. Frederick Laws as Chief of Staff, whose members were Drs. Frederick Laws, Henry Cotton and P. M. Holl; the surgical staff, Drs. Jacob Hvoslef, P. A. Aurness, George Haggard, and C. G. Weston; and the consulting staff of Drs. A. W. Abbott, and J. E. Moore. Drs. K. O. Bendeke and W. A. Jones were specialists in eye, ear, nose and throat, and nervous and mental diseases, respectively.

ASBURY HOSPITAL was opened September 1, 1892, under the auspices of the deaconess organization of the Methodist church and through the efforts of Mrs. Sarah Harrison Knight, who continued as its superintendent until her death in 1928. Mrs. Knight founded the Rebecca M. Harrison Deaconess home in 1891 after the Northwestern Deaconess Home, of whose board of control she was a member, had been abandoned. The care of the sick charges of her deaconesses and the training of deaconess nurses necessitated a hospital organization. She purchased the entire capital stock of the Minnesota College Hospital, which included a building at the corner of Ninth Avenue and Sixth Street South, which had been used as a dispensary by the University of Minnesota, and opened a hospital of thirty-four beds. In the first two and a half years they had cared for 1,065 patients in the hospital and 5,226 in the free dispensary.

In February, 1895, a fire partially destroyed the hospital. The patients were removed without harm and housed in St. Barnabas Hospital until the damage of the fire was repaired and patients again received less than three months later. The subsequent chapters of new buildings at the corner of Elliot Avenue and Ninth Street South, of the lease to the Veterans' Bureau and of the present building at 916 East 15th Street, took place after the turn of the century and so do not belong in the present volume.

Among the doctors whose names appear in the early records are found: Dr. F. R. Woodard, who is said to have brought the first patient to the hospital, Drs. F. A. Dunsmoor, G. G. Eitel, J. Warren Little, H. M. Bracken, W. A. Jones, George Douglas Head, Louis A. Nippert, J. C. Litzenberg, Arthur Gillette, Wm. R. Murray, and Frank C. Todd.

(To be continued in March issue)

CASE REPORT

SULFAPYRIDINE IN THE TREATMENT OF STAPHYLOCOCCUS SEPTICEMIA

J. S. BLUMENTHAL, M.D.

Minneapolis, Minnesota

A REPORT of recovery in a disease as almost invariably fatal as staphylococcus septicemia is always of interest. The introduction of sulfanilamide and more recently sulfapyridine in infections of all kinds has resulted in recent reports of recovery in several cases of this type. Morris⁵ reports a case with four positive cultures of staphylococcus albus treated with antitoxin, transfusions and sulfanilamide; Thornhill, Swart, and Reel⁷ report two cases of staphylococcus aureus septicemia which recovered following use of sulfanilamide, transfusion and drainage of localized abscesses. Fenton¹ and Hodgkins¹ used sulfapyridine in staphylococcus aureus septicemia with an atypical clinical picture with good results. O'Brien and McCarthy⁶ report using sulfapyridine in a staphylococcus bacteremia following furunculosis with recovery, as does Maxwell⁴ in the same type of infection in a case of pneumonia. Goldberg and Sachs² used sulfapyridine with recovery in two cases of staphylococcus bacteremia. Long³ reports sterilization of the blood in three out of five patients with staphylococcus bacteremia.

The case now reported is that of a man, aged fifty-four, admitted to St. Andrews Hospital, April 2, 1939, with a history of having fever and headache of several hours' duration. He had had an upper respiratory infection for several days but with no serious symptoms and apparently no fever or cough. He had no other complaints on admission. His past history was negative except for a history of lues of ten years duration adequately treated. He had had an osteomyelitis of his right big toe, which had been amputated eight years ago with no complications thereafter. He is married and has a wife and four children living and well. He had noticed some incontinence the last year. Otherwise the past history was essentially negative.

Examination revealed a very sick patient who had no subjective symptoms and now said he felt fine. His temperature was 105° F. The only positive findings were failure of pupils to react to light and absent knee jerks. The prostate was apparently normal but there was a residual of 600 c.c. of urine. His hemoglobin was 56, r.b.c. 3,200,000, w.b.c. 10,350. Blood smears showed a shift to the left in polymorphonuclears with a differential of 92 per cent neutrophils, 7 monocytes, 1 eosinophile. His blood Wassermann was negative and Kline 2 plus. The urine showed albumin positive with 250 to 350 pus cells, 2 to 4 r.b.c. per field. Blood urea nitrogen was 14.1 mg. per 100 c.c. of

blood. Spinal puncture was entirely negative. Urine culture on April 6, 1939, showed a positive staphylococcus albus culture and blood cultures on April 13 and April 14 showed the same organisms. On the basis of these findings, the diagnoses were cord bladder, cystitis with staphylococcus albus septicemia.

An indwelling catheter was inserted and the bladder irrigated with potassium permanganate. Sulfanilamide in 6 gram daily doses was given but with no improvement and after six days sulfapyridine in 5 gram daily doses was substituted. On this therapy the temperature began to drop and the patient looked improved. His urine cleared up until on April 18, 1939, there were only 2 pus cells per field.

Transfusions of blood, 2,500 c.c. in all, were given on April 14, 17, 25, May 2, and 8. His leukocyte count had gradually dropped until it was 6,000 on May 4 but the sulfapyridine had been continued due to a still slightly septic temperature. On May 10, the patient was sent home in fairly good condition but with catheter still indwelling as he had difficulty in voiding. When it was removed, after a few weeks at home, the patient voided with no difficulty. The sulfapyridine was given for three weeks in gradually decreasing doses.

Comment.—A case is reported of staphylococcus albus bacteremia with cord bladder treated by sulfapyridine with recovery. It is, of course, questionable how much credit, in this case, should be given to the transfusions, which were primarily used to increase the red blood count and hemoglobin, and how much to the drug; but certain it is that since the use of sulfapyridine more cases of recovery in staphylococcus septicemia have been reported and in this patient definite improvement was manifest after its use and also after failure to improve on sulfanilamide.

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President's Letter

ON February 24, the Annual Officers' Conference will be held in Saint Paul. Excepting the annual meeting of the State Medical Association this is the most important medical meeting held in our state; and in some respects this annual conference of county society officers stands out above the State Medical Association meeting. It is particularly important that the secretaries of the county and district medical societies attend, for they are the spark plugs that energize the societies. The president and other officers, the committee members and especially the committee chairmen each have an important part to play; but an active, tactful secretary can do more to keep a society active and useful than anyone else.

Reports will be given at this meeting on what is going on in other societies—county, state, and national. The relief situation in its innumerable ramifications will be discussed; the latest information as to what Washington proposes to do will be available. Although but little information has been given out as yet regarding a new Wagner Bill, we are told there is one in the offing.

Economic changes are in the forefront today, and it is no time for any physician, much less any society, to be indifferent. That the doctors in our country are realizing the dangers inherent in impending changes in our economic status is shown by the greatest increase in the A.M.A. membership in decades and also by the very generous support being given the new National Physicians' Committee for the Extension of Medical Service. These are heartening signs, but our efforts must continue, and we may be called upon for more strenuous work than ever.

BERTRAM S. ADAMS, M.D., President
Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL
ASSOCIATION

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and Publishing Committee

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BUSINESS MANAGER

J. R. BRUCE

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SULFAPYRIDINE AND PNEUMONIA

THE numerous reports on the use of sulfapyridine in pneumococcic pneumonia have served to standardize to considerable extent the use of this new drug. While the drug is not without its drawbacks and the possibility of toxic manifestations of serious import must be ever kept in mind, the numerous reports of series of lobar pneumonia with mortality rates of less than 10 per cent from the use of sulfapyridine alone or in conjunction with serum indicate a great advance in the treatment of this disease.

The accepted treatment is now to begin the administration of sulfapyridine as soon as a diagnosis of lobar pneumonia is made. The same holds true of postoperative pneumonia, and even in bronchopneumonia, which may be due to the pneumococcus. Every effort should be made to determine the type of pneumococcus. Upon determination of the type there is good reason to administer serum, although in many cases the improvement by the time the type is determined may justify its omission. Smaller dosage of serum seems to be effective when given in conjunction with sulfapyridine.

The purpose in sulfapyridine therapy is to obtain the maximum effect on the pneumococcus in the shortest possible time and to maintain its inhibitory effect on the pneumococcus until the infection is overcome. The initial dosage should be large, 60 grains, or the first two doses 30 grains each at an interval of four hours, and then 15 grains every four hours, day and night. It is well to give the drug following nourishment to minimize the likelihood of nausea and vomiting, although these symptoms are due to an effect on the central nervous system rather than on the stomach direct. If a dose is vomited within an hour after taking, the dose should be repeated. Vomiting is a main drawback in the use of the drug, but ordinarily does not contra-indicate continuance of its use.

One may expect a marked drop in temperature and pulse in twelve to forty-eight hours. If there is no such response within two days, continuation of the drug is probably useless and the etiologic bacterium is probably not the pneumococcus, although some strains of this organism are probably more resistive to the drug than others and absorption of the drug and blood concentration is quite variable.

Because of the rare occurrence of severe toxic effects from the administration of this drug, daily check should be made of hemoglobin percentage, leukocyte count and kidneys, the presence of blood in the urine indicating kidney damage. Jaundice is sufficient indication for discontinuation of the drug. Cyanosis other than

that due to the disease is apparently no indication for stopping the medication.

Ureteral concretions have been reported following the administration of sulfapyridine, more especially following the use of large amounts, although rarely have they been reported following comparatively small doses. The stones are composed of acetylsulfapyridine, are not radio-opaque and probably mechanically produce the hematuria. They apparently disappear on cessation of the drug and fluid administration in large amounts.

Although lobar pneumonia in children is not as severe a disease as in adults, some of the reports of the use of sulfapyridine in these cases are unbelievable. The recommended dosage for infants under two years is 1.5 grains per pound of body weight the first day, and half this amount succeeding days. For those over two years of age the dosage of 1 grain per pound for the first twenty-four hours, and half the amount each day following, has been accompanied by admirable results. The tablets may be crushed and administered in cereal, apple sauce or fruit juices. There seems to be no advantage in prolonging medication for longer than a day following the crisis.

Attention has been called to the fact that crisis in pneumonia treated with sulfapyridine is not accompanied by the feeling of well-being usually experienced. The appearance of the chart rather than that of the patient is a better indication of the progress of the infection. There is reason to believe that resolution of the consolidated lung begins at an earlier date.

Newspaper publicity to the effect that this new drug is 100 per cent effective is to be deprecated. The drug is showing a marked reduction in mortality from pneumococcal pneumonia, but is doubtless not the last word in chemotherapy for this infection.

VIRUS RESEARCH AND ANIMAL EXPERIMENTATION

WITHIN the present decade an amazing amount of progress has been made in the field of the investigation of filterable virus diseases. That this has been possible is due to the discovery of the fact that only by animal inoculation could the course and effects of virus disease be studied and the facts proved. Until this was

determined to be the case much time and effort were expended in following the culture and staining procedures which are so essential in bacteriologic research but give no help whatever in the solution of virus disease problems. In the study of virus disease the culture tube has been supplanted by the living animal, as Francis so aptly stated in his recent article in MINNESOTA MEDICINE.

Here, then, we see one of the most important advances of recent times in a difficult and baffling field made by the utilization of methods which are unreservedly condemned by those who fanatically oppose all types of animal experimentation. Here is concrete proof of its value, in a large way, but it will not be accepted as conclusive evidence by those who choose to cherish their antagonism. The onward march of scientific medicine has always been beset by ignorance and bigotry but somehow or other it has always managed to keep going. It is not a very comforting matter for reflection that from the very beginning up to the immediate present every discovery of value has been made by not merely unravelling the inherent difficulties of a problem but against determined human opposition.

GILBERT COTTAM.

FARMER TO HIS SON

The Conservation Checks ain't out,
I hear they're on the way,
But guess there won't be much for beer
'Cause there's some bills to pay;
We've got to pay the grocer-man,
His terms are strictly cash,
If he's not paid right on the dot
We'll have to live on hash.

I think we'd better pay the guy
That sold us that there seed,
Or he might up and say, "No, sir!"
Right in our time of need;
I'd like to pay the doctor some,
Perhaps a buck or two
Upon account of long ago
Would keep him smiling through!

But then there is the station man,
Where we get gas and stuff,
He's apt to say, "No more, my man,
I've let you take enough."
And then there is the permanent
Your mother wants so bad . . .
For things like that we must pay cash;
Remember that, my lad!

But "Doc" will speed through snow and cold
To serve us when we call—
The thought that age has yellowed bills
Don't slow him up at all;
The other guys must all be paid,
Accounts kept up to date . . .
So till we get our next year's check
We'll let the doctor wait.

—EVELYN OSLUND.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

MEDICINE AND PUBLIC OPINION

AS ONE reviews the political events of the past year as they affected the medical profession, one is impressed with the fact that our position today has definitely improved. Legislation favoring governmental control of medicine has been defeated, both in Congress and in the individual states. It is evident that intelligent public opinion questions whether medical care would be improved by governmental edict, and that the value of free initiative and independence of the physician is recognized.

Reaction Reassuring

The reaction of the press toward the judicial rebuff given federal prosecution of the American Medical Association in the courts was most assuring. It was a signal victory for organized medicine. Progress in this case since then also has been very satisfactory. The defeat of the Wagner Bill, and, of even greater importance, the recent criticism of the bill with admissions of its shortcomings by top-ranking federal officials, shows clearly that they fear the consequences of radical changes in medical care.

The haphazard methods of preparing legislation in the all-important field of Health are clearly illustrated by the Wagner Health Bill. This was emphasized in public hearings on the bill when representatives of organized medicine showed its many inconsistencies. That portion of public opinion which demanded some change in the distribution of the costs of medical care should be appeased by the serious efforts on the part of numerous state and county medical societies to solve this problem. It is generally admitted that compulsory health insurance is undesirable. Various plans of voluntary insurance are being given thorough trials and it is to be hoped that some feasible plan eventually will be evolved.

Swing to Conservatism

The platform recently announced by the American Medical Association adopts a liberal attitude toward these problems which should quiet accusations of reactionism. Then too, a noticeable swing of public opinion toward conservatism and a desire for financial economy have greatly reduced the chances for large congressional appropriations for health reform.—W. F. B.

SEEING EYE TO EYE WITH LEMKE

It is indeed heartening to find a distinguished layman seeing eye to eye with organized medicine in a mutual opposition to regimentation, standardization, bureaucracy and socialized medicine.

Physicians who chanced upon the February issue of a certain popular magazine were especially pleased, no doubt, to note that Congressman William Lemke of North Dakota is sturdily opposed to all four. At the same time it was a little disturbing to the physicians that Mr. Lemke should profess to find the evils of bureaucracy, regimentation and standardization residing in the voluntary democratic organization of physicians. Particularly when it is the physicians' organization which is generally recognized as one of the most potent agencies in opposition to all three in American life today. It was still more surprising that it should be Mr. Lemke who is thus expressing himself with regard to bureaucracy since Mr. Lemke is generally regarded as an exponent of the political philosophy which finds expression in more and more government bureaus.

Investigation Proposed

In any case, it is on the ground of its regimentation, standardization and bureaucratic domination of medical men that Mr. Lemke proposes a Congressional investigation of the American Medical Association in this article.

Of course, the American Medical Association and its members will not oppose a Congressional investigation; on the contrary they may welcome it as one excellent means of impressing upon the Congress and the American people the accomplishments, aims and ideals of the independent medical profession of the United States.

UNSUITED TO MINNESOTA

The President's plan for hospital building where hospital facilities are lacking will undoubtedly have the support and approval of physicians and hospital authorities, provided the building is limited to communities that stand in actual need.

A preliminary inquiry from Washington concerning needs in Minnesota would indicate, however, that Washington planners are not thinking in terms of Minnesota and its needs.

There are undoubtedly a few isolated communities in Minnesota that need hospitals. Small hospitals of fifteen or twenty beds would amply serve these communities.

Would Not Be Used

Experts have advised the government, however, that it is uneconomical to construct and operate hospitals of less than 50 bed capacity whereas it is clear to Minnesota experts that anything larger than twenty-bed institutions in these Minnesota communities would be wasted. The beds would not be used and could not be maintained.

In the tone of this inquiry as in most other government planning it is obvious that the planners are thinking in terms of the South with its large negro population and that any nation-wide plan adapted primarily to southern needs would be utterly unsuited to the sparsely settled regions of Minnesota.

Federal Support Might Be Sought

It should never be forgotten, either, in making plans for government hospitals, anywhere, that the community must pay for the upkeep. Most communities which are already unable to build a hospital will also find it difficult to support one. In that case the hospital will have to be maintained by the state.

Probably direction in state-maintained hospitals would be put in the hands of State Boards of Health and, in Minnesota, the direction and management would undoubtedly be admirable. Cer-

tainly it would be carried on in close coöperation with the Minnesota State Medical Association. In other states the story might be different and in some, no doubt, state support would be refused, altogether, and the hospitals would become federally built and supported institutions.

It was suggested from Washington that the new hospitals might become health centers and house the local county or community public health units. In Minnesota, again, such an arrangement should be entirely satisfactory. There is always the possibility, however, that the public health unit, itself, rather than the state board of health or the state or county medical society would supervise the hospital. Then trouble might arise.

Details Should Be Discussed

All of the details of support, management and supervision should certainly be thoroughly discussed before any hospital building program is undertaken.

"IN JUDGMENT"

[Monthly editorial prepared by the Medical Advisory Committee]

Today the American people sit in judgment on the good and evil works of the various professions. After spending thousands of dollars to educate a medical man, they attempt to break down his morale and try to dissipate that which is most dear to him—his personal interest in his personal clientele and that patient-doctor relationship with which nothing else can compare.

This interest is a duty and this relationship a privilege which, as one grows older in the practice of medicine, becomes more sacred. But there is also an obligation to the men in our profession, our professional brothers. Many of the older pioneers in our state fought for the honor of the individual members of the profession, feeling, as you and I should, that when anyone is assailed by slander the whole membership suffers.

Malpractice litigation in the main is essentially slander against the whole medical profession and makes it easy for the "I told you so's" to conform to the present day feeling that the medical man is not doing his duty to the citizens of the land, that the sick of this country do not have the best in medical care because of carelessness on the part of the doctor, and that reg-

(Continued on Page 129)

COUNTY OFFICERS' MEETING

Hotel Saint Paul—Saturday, February 24, 1940

The annual County Officers' Meeting of the Minnesota State Medical Association is always of interest to large numbers of physicians who are not, strictly speaking, officers of county or district medical societies.

The program arranged for the 1940 meeting scheduled for Saturday, February 24, at the Saint Paul Hotel, is open to any member of the association. As usual, expenses of the secretary or an alternate representative from each society will be paid.

Frank discussion of the problem of expert medical testimony as it looks to a county attorney will be an important feature of the 1940 program. Mr. James A. Garrity of Moorhead will give this discussion under the title, "The Doctor in Court."

Among other guest speakers of particular in-

terest are Dr. C. M. Peterson of Chicago, secretary of the American Medical Association's Council on Industrial Health, who will talk on the work of his council; Dr. R. G. Leland, also of Chicago, director of the American Medical Association's Bureau of Medical Economics, who will talk about national plans for health legislation, and Mr. Walter Finke of St. Paul, director of the new Division of Social Welfare, who will discuss the new medical program of his division. The new program was, incidentally, drawn up with the aid of his medical advisory committee and approved by the Council.

Round table breakfast discussions on subjects of current importance to Minnesota physicians will open the day's sessions. Breakfasts will be served at 8:30 and will be open to all physicians.

The complete program follows:

PROGRAM

8:30 a.m.—Round Table Breakfasts

1. Vaccination and Immunization Campaigns
—L. R. CRITCHFIELD, M.D.

Discussion of Local Organization, Methods, Charges

2. Relations with the University Hospitals and State Institutions

GEORGE EARL, M.D.

Discussion of Admissions and Discharges as Related to Eligibility and Subsequent Coöperation with Local Physicians

3. Inter-Professional Relations

J. M. HAYES, M.D.

Discussion of Local Relations with Allied Groups Such as Dentists, Pharmacists, Lawyers

4. Proposed Legislation for a Federal Hospital Building Program

L. L. SOGGE, M.D.

Discussion of Needs in Minnesota, Population to be Served, Number of Beds, Administration and Control, Future Uses

5. Medical Relief Problems

W. A. COVENTRY, M.D.

Discussion of the Law Relating to Choice of Vendor, also of Fees for Indigent Cases, Farm Security Clients, Authorizations, Hospitalization

10:00 a.m.—General Session

Presiding Officer—B. B. SOUSTER, M.D., St. Paul
Survey on Methods of Handling Medical Relief in Minnesota: Report

—W. A. COVENTRY, M.D., Duluth

Rôle of the County Contact Committee in the New Social Welfare Program

—A. W. ADSON, M.D., Rochester

Extension of Group Hospital Service

—A. M. CALVIN, St. Paul

County Fracture Programs

—R. C. WEBB, M.D., Minneapolis

Industrial Health

—C. M. PETERSON, M.D., Chicago

The Doctor in Court

—JAMES A. GARRITY, Moorhead

12:00 m.—Luncheon

Presiding Officer—B. S. ADAMS, M.D., Hibbing
Medical Program of the Division of Social Welfare

—WALTER W. FINKE, St. Paul

National Health Program

—R. G. LELAND, M.D., Chicago

Continuation Study Courses

—W. A. O'BRIEN, M.D., Minneapolis

Public Health Discussions in County Medical Societies

—O. O. LARSEN, M.D., Detroit Lakes

Board of Health Program for 1940

—A. J. CHESLEY, M.D., Minneapolis

"IN JUDGMENT"

(Continued from Page 127)

ulations and laws must be passed to regiment the practice of medicine.

Undue criticism by any unthinking man is a despicable thing, especially when used to increase his own prestige at the expense of another. Certainly no one is so blind as he who cannot see that there will be a reflection on himself.

Your Medical Advisory Committee believes that a knowledge, not an abuse, of our responsibility to each other guarantees an abundance of satisfaction and will help in the moulding of public opinion to our way of thinking.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Saint Paul Abortinist Sentenced to Two-Year Prison Term

Re: State of Minnesota vs. Arthur N. Alexander.

On December 9, 1939, Arthur N. Alexander, forty-eight years of age, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of abortion. Following a statement of the facts to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, Alexander was sentenced by the Honorable Arthur W. Selover, Judge of the District Court, to a term of not to exceed two years at hard labor in the State Prison at Stillwater.

Alexander was arrested by the St. Paul Police Department at his residence at 78 North Smith Avenue on December 6, 1939, following the signing of a complaint against him by the husband of a 41-year-old Minneapolis woman upon whom Alexander performed a criminal abortion on November 21, 1939. Alexander had gone to the home of this woman in Minneapolis and offered to perform this abortion for a fee of \$25.00. He was given \$5.00 at the time, but the balance was not paid for the reason that the patient became seriously ill and was removed to the Minneapolis General Hospital. The matter was referred to the Women's Bureau of the Minneapolis Police Department with Alexander's arrest immediately following. Upon being arraigned in the Municipal Court, Alexander's case was continued and his bond fixed in the sum of \$5,000. He later decided to plead guilty with the above result.

Alexander formerly held a license to practice chiropody in the State of Minnesota. This license was revoked by the Minnesota State Board of Chiropody Examiners on September 19, 1935, at which time Alexander entered a plea of guilty in the District Court of Ramsey County to an information charging him with practicing healing without a basic science certificate. For that offense Alexander was sentenced to a term of one year in the Saint Paul Workhouse and placed on probation. Since that time, he told Judge Selover, he had worked as a clerk and as a salesman for summer resort property. Alexander has had numerous difficulties with the law, having been arrested in Saint Paul on eight occasions between 1933 and 1935, several of the charges against him being drunkenness. In the present case, Alexander thought he should be

placed on probation, but he was promptly told by Judge Selover that with his previous bad record, he did not deserve to be placed on probation, and accordingly was sentenced to the prison term. The investigation conducted in the current prosecution also disclosed that Alexander had performed a criminal abortion upon another Minneapolis girl for which he was paid the sum of \$45.00.

The Minnesota State Board of Medical Examiners wishes to acknowledge the very fine cooperation received in this case from the Women's Bureau of the Minneapolis Police Department, and particularly from Lieutenant Blanche Jones, head of the Bureau, and Mrs. Edith Evans, policewoman. Some splendid results have been achieved in Minneapolis in this class of cases, and a large portion of the credit is due to the very prompt and efficient investigations conducted by the Women's Bureau. It has been a pleasure for the Minnesota State Board of Medical Examiners to cooperate with that Department.

Unlicensed Physician Sentenced to 50-Day Jail Term at Slayton

Re: State of Minnesota vs. John G. Halland.

John G. Halland, forty-six years of age, who formerly was licensed to practice medicine in the State of Minnesota, was sentenced on November 29, 1939, by Justice of the Peace J. K. Campbell, at Slayton, Minnesota, to a term of 50 days in the County Jail, the sentence to be served in the County Jail of Cottonwood County. Judge Campbell found Halland "guilty of interfering with the rural schools of Murray County by frightening the teachers and inspecting school records without proper authority from the County Superintendent or the Commissioner of Education.

Halland graduated from the Medical School of the University of Minnesota, in 1919, with the degree of Bachelor of Medicine. His license as a physician was revoked by the Minnesota State Board of Medical Examiners in November, 1931, because of habitual indulgence in the use of drugs. Halland has not been licensed to practice medicine in Minnesota since that time. He has a long record of difficulties with the law dating back to 1925, when he served one year in jail at Santa Fe, New Mexico, for a violation of the Federal Narcotic Law. In 1927-1928 Halland served fourteen months in the Federal Penitentiary at Leavenworth for a similar offense committed at Denver, Colorado. In 1932, he served seventy days in the Minneapolis Workhouse. In September, 1933, he pleaded guilty in the District Court at Fergus Falls to an information charging him with the crime of practicing medicine without a license. He received a suspended sentence of six months at that time.

Minnesota Physicians Reprimanded for Failure to File Birth Certificates

Following repeated complaints from the Division of Vital Statistics of the Minnesota Department of Health that certain members of the medical profession in Minnesota were violating the laws of this State in reference to the filing of birth certificates, the Minnesota State Board of Medical Examiners ordered an investigation to be made to determine the facts and what steps are necessary to be taken to secure the cooperation of those physicians who repeatedly neglect, or refuse, to comply with those laws. That investigation disclosed that a small number of physicians have repeatedly failed to comply with the birth registration law and with no plausible explanation for their failure. At the November, 1939, meeting of the Minnesota State Board of Medical Examiners one physician was ordered to appear before the Board and explain his repeated failure to comply with those laws. The facts in that case indicate that it was necessary for the State Department

of Health to send him nine letters in a period of four years in their attempt to secure birth certificates in cases attended by that physician. In addition, a personal call had been made upon the physician by a representative of the State Department of Health and also by a representative of the State Board of Medical Examiners. Despite the leniency extended this physician he still had outstanding two birth certificates, one as far back as March, 1939, and another in June, 1939. In this case the physician was advised by the State Board of Medical Examiners that unless he complies with the law in the future, a citation will be issued requiring him to show cause why his license as a physician should not be suspended or revoked.

The investigation made by the Medical Board clearly shows that the State Department of Health has been extremely lenient with the medical profession in this problem. On the other hand, there is no good reason why it should be necessary for local registrars and the State Department of Health to spend a great deal of time and money securing birth certificates from the attending physicians. It is not the desire of the State Department of Health to be severe, nor unreasonable, in the enforcement of the laws pertaining to births, nevertheless, it is very apparent that the law must be enforced and that it is of extreme importance to the patient, to the child, to the public in general, and to governmental authorities, that these certificates be filed. The law itself is very simple; the pertinent portions thereof could be summarized as follows:

1. The law requires the physician or midwife attending the birth of any child to subscribe and file a birth certificate with the local registrar within five days after the birth of the child.
2. If no name has been given the child within that time, the attending physician or midwife shall deliver to the parents a blank for a supplemental report of the given name of the child.
3. The law also provides that when a certificate of birth is filed without the given or baptismal name the local registrar shall deliver to the parents a blank for a supplemental report of the name.
4. If the child is illegitimate the name, residence and other identifying details relating to the father cannot be entered in the birth certificate without the consent of the father.
5. The law also provides that any person who shall violate any of the provisions of the law shall be guilty of a misdemeanor and shall be punished by a fine of not more than \$100.00 or imprisoned in the county jail for not more than ninety days.

Most of the violations of this law on the part of the medical profession are occasioned by the failure of the attending physician to file the birth certificate within the statutory period. The great majority of the physicians in Minnesota file these birth certificates promptly and within the period provided by the law. It is the hope of the Minnesota State Board of Medical Examiners that those physicians who are violating this law will make it a point, in the future, to comply with it. Certain it is that further violations of the law will result in the suspension of the medical licenses of the physicians involved.

Ely "Rheumatism Doctor" Sentenced to Six-Months Jail Term

Re: State of Minnesota vs. J. F. Brown, alias William Brown.

On December 14, 1939, J. F. Brown, also known as William Brown, sixty-four years of age, of Ely, Minnesota, entered a plea of guilty before the Honorable Edward Freeman, Judge of the District Court of St. Louis County, at Virginia, Minnesota, to an information charging him with practicing healing without a

basic science certificate. After a statement of the facts to the Court by Mr. John Arko, Assistant County Attorney, Judge Freeman sentenced Brown to a term of six months on the St. Louis County Work Farm. Judge Freeman told Brown that, after he had served thirty days of the sentence, the Court would suspend the remaining five months and place Brown upon probation for one year, upon the condition that he absolutely refrain from practicing healing in any way, shape or manner.

Brown, a Negro, who gave his birthplace as San Antonio, Texas, was arrested on December 13, 1939, following an investigation by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, which investigation disclosed that Brown had been representing himself as a rheumatism doctor and had been giving various medications to patients for which he charged sums ranging from \$1.00 to \$2.00 per treatment. He also attempted to give massage treatments and used a so-called sun lamp in connection with his work. Upon being questioned, Brown admitted that he had no medical training whatsoever, but that he had been employed for many years as a shoe shiner and pants presser. He stated that he had lived at Houghton, Michigan, for twenty years and had been on the Minnesota Iron Range once before in 1927, after which he lived, for a number of years, at Duluth. He stated that because of his inability to find any work he turned to the unlawful practice of medicine to make his living. Brown's patients were men employed in the iron mines. Upon being questioned concerning the source from which he obtained his various medicinal preparations, Brown replied that he bought them from one H. P. Clearwater, Ph.D. The pamphlet indicates that Clearwater is a licensed pharmacist in the State of Maine. This case again emphasizes the ease with which an unsuspecting public is victimized by unscrupulous individuals.

Minneapolis Naturopath Sentenced to 4-Year Prison Term for Abortion

Re: State of Minnesota vs. Thomas N. Visholm.

On January 15, 1940, Thomas N. Visholm, seventy-six years of age, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed four years at hard labor in the State Prison at Stillwater, Minnesota. Visholm had previously pleaded guilty, on December 22, 1939, to an indictment charging him with the crime of abortion committed on or about December 14, 1939, at the defendant's combination office and residence at 2312 Humboldt Ave., South, Minneapolis. Following an investigation of the case by the Probation Office of Hennepin County, and a statement to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, Judge Reed stayed the execution of the sentence and placed Visholm on probation for a period of five years, during which time Visholm will be subject to the rules and regulations of the Probation Officer, and, among other things, he is to absolutely refrain from practicing healing in any manner in the State of Minnesota.

Visholm was arrested following an investigation by the Women's Bureau of the Minneapolis Police Department of a report that a criminal abortion had been performed by him on an unmarried girl who resides at New Brighton. At the time of his arrest deputy sheriffs and police officers seized Visholm's surgical instruments and equipment used by him in the performing of criminal abortions. The girl who had been aborted was taken ill and removed to the Minneapolis General Hospital. She has recovered and has been discharged from the hospital. The girl stated that she paid Visholm \$50.00 for his services. Visholm stated that

(Continued on Page 148)

◆ OF GENERAL INTEREST ◆

Dr. C. R. Chadbourne has disposed of his practice at Janesville and will move to Saint Paul, where he expects to continue his medical practice.

* * *

Dr. Clifford T. Wadd of Waseca has purchased the practice of Dr. C. R. Chadbourne in Janesville. Dr. Wadd is a graduate of the University of Minnesota and had practiced in association with Dr. O. J. Swenson at Waseca the past year and a half.

* * *

Dr. Everett B. Coulter, a former member of the staff of Minneapolis General Hospital, has opened offices in Madelia, Minnesota, for the general practice of medicine.

* * *

Dr. Gordon C. Edwards and family, formerly of Cokato, are now making their home in Saint Louis Park. Dr. Edwards has been granted a scholarship for a year's study at the University of Minnesota and later will enter public health work.

* * *

Dr. C. E. Johnson, who has been engaged in government work at Blackduck for some time, has returned to Pine River and will resume his medical practice there.

* * *

Dr. M. J. McMahon and family of Green Isle left early in January for New Orleans, where they will spend several months. Dr. McMahon will devote his time to taking a postgraduate course at Tulane University.

* * *

With the start of the new year, Dr. B. F. Osburn of International Falls turned over the operation of the Northern Minnesota hospital to Dr. C. C. Craig and Dr. R. H. Monahan and has retired from the active practice of medicine.

* * *

Dr. O. J. Johnson of Lyle has announced his association in practice with Dr. A. W. Allen at Austin. Dr. Johnson will continue his Lyle practice and will also continue to reside there.

* * *

Dr. J. A. Mason of International Falls, who has been associated in the practice of medicine with Dr. B. F. Osburn for four years, announces that he has established his own office in the First National Bank Building.

* * *

Oculists particularly are warned against the crooked tactics which have been used by a swindler, apparently for some time, on members of their specialty. The man is about forty-nine years old, approximately five feet ten inches and weighs about 155 pounds. He has light sandy hair, blue eyes and a ruddy complexion and is smooth shaven. His stunt is to be fitted for glasses and

then for payment presents a check, usually for \$30.00, asking for the difference in cash. He apparently gives the impression of being an honest farmer, for he has swindled oculists in Missouri and North Carolina.

* * *

Dr. Norbert J. Lilleberg has become associated with Dr. Lee W. Barry, with offices at 814 Lowry Medical Arts Building, Saint Paul, in the practice of obstetrics and gynecology.

* * *

Saint Joseph's Hospital, Saint Paul, has recently purchased 50 milligrams of radium for the use of members of its staff. A fee schedule comparable to those in use at the other hospitals in Saint Paul has been established.

* * *

Pneumonia Serum

Owing to lack of funds, free distribution of pneumococcic serum was limited to Type I and II beginning July 1, 1939. In November certain available federal funds made it possible again to provide specific serum for all the types of pneumococcic pneumonia and to continue the twenty-four-hour typing service.

* * *

The coöperation of American citizens is asked by the Bureau of Census of the Department of Commerce in its decennial census to be taken this year. The census will inquire into population, occupations, housing, agriculture and business in general. Answers to questions are required by law and are confidential. The Division of Vital Statistics in the Census Bureau is one of the important activities of the Bureau.

* * *

Dean Harold S. Diehl of the University of Minnesota Medical School has been appointed a member of the National Advisory Health Council of the United States Public Health Service. The primary function of this Council is to advise with the Surgeon-General concerning the scientific and research work of the Public Health Service.

* * *

Dr. Ruth E. Boynton, Director of the University of Minnesota Students' Health Service and Professor of Preventive Medicine and Public Health, has been elected as President of the American Student Health Association.

* * *

Dr. George L. Streeter, Director of the Carnegie Laboratories at the Johns Hopkins Hospital, Baltimore, visited the University of Minnesota Medical School on January 17 and 18. He lectured before the medical faculty and students on "Early Stages of Macaque Development and Their Significance in Primate Embryology."

* * *

Dr. Albert V. Stoesser, Associate Professor of Pediatrics, University of Minnesota, has received a grant-

IN MEMORIAM

in-aid from the John and Mary M. Markle Foundation in support of his studies on water and electrolyte metabolism in intractable asthma.

Dr. C. Meredith Guernsey, University of Minnesota, M.D. 1934, who has been associated with the division of surgery of the Mayo Clinic and Mayo Foundation since 1935, has recently moved to Chico, California, where he has taken over the position of Surgeon to the Chico Clinic and the Enloe Hospital.

Mrs. John Dwan has made a gift of \$5,000 to the Minnesota Medical Foundation for support of the program of the Human Serum Laboratory, which was established at the University of Minnesota Medical School in 1938. The Laboratory is administered by a committee including Dr. Irvine McQuarrie, Dr. Paul Dwan and Dr. Erling Platou as a research and service project on the use of human serum for the prevention and treatment of certain infectious diseases.

In Memoriam

Ernest H. Bohland

1874-1940

Dr. Ernest H. Bohland died suddenly at his home in Saint Paul, 144 North Lexington Parkway, January 10, 1940.

He was born in Saint Paul, October 12, 1874, attended the Saint Paul public schools and Macalester College prior to the study of medicine. He received his M.D. from the Hamline Medical School in 1903. Later, he did post-graduate work at Rush Medical School. He practiced at Hanover, Minnesota, for two years and then came to Saint Paul, where he maintained an office at Goodrich Avenue and West Seventh Street throughout his career. In addition, he had an office association with Drs. Goodrich, Dennis and Gilfillan, and later with Drs. Savage, Brand and Nichols. He was on the staffs of St. Joseph's, St. Luke's, the Miller and the Children's Hospitals. He belonged to the Odd Fellows, and was a member of the Parish of St. Luke's and of the University Club.

In 1909, he was married to Miss Laura Taillefer.

There were few sports in which Dr. Bohland did not take part. In his early days he was on the racing squad of the Minnesota Boat Club; in his college days he was active in track athletics and football, and later in life a devotee of golf. He did a good deal of bird shooting, deer hunting and fishing.

To those of us who knew him best, his outstanding characteristics were his integrity, honesty and sincerity of purpose.

Surviving him are his wife; a daughter, Mary; a

son, Taillefer; a brother, John A. Bohland; and three sisters, Mrs. James E. Orme, Miss Beatrice Bohland and Mrs. J. S. Sweitzer.

Charles Rasmi Christenson

1867-1940

Dr. C. R. Christenson of Starbuck, Minnesota, died January 14, 1940. Death was due to a perforated peptic ulcer.

Dr. Christenson was born at Portage, Wisconsin in 1867. He received his early education in Owatonna. After studying a year at the University of Minnesota he taught school for two years and then returned to the University of Minnesota where he received his M.D. degree in 1895. He spent the next year as interne at Saint Barnabas Hospital in Minneapolis.

After moving to Starbuck in 1896, Dr. Christenson on several occasions took postgraduate work in Chicago, Philadelphia and Boston. In 1914 he traveled abroad, visiting the Scandinavian countries and Germany.

In September, 1917, Dr. Christenson sold his equipment and moved to Morris where he remained until he entered the Army Medical Corps at the time of the World War. He was stationed at Battle Creek, Michigan. Following the war he returned to practice at Morris until 1922 when he returned to Starbuck. At various times he was a member of the school board, coroner, a member of the council and mayor of Starbuck.

In 1930 he moved to Minneapolis where he practiced until 1936. In 1936 he again returned to Starbuck.

Dr. Christenson was a member of the Minnesota State and American Medical Associations until 1936.

George A. Kohler

1863-1940

Dr. George A. Kohler, Minneapolis, died January 9, 1940, at the age of seventy-six.

Dr. Kohler was born at Long Lake in 1863 and moved to Watertown, where he received his early education. He was a graduate of the Northwestern University School of Pharmacy and the Illinois College of Pharmacy. After graduating from Hamline Medical College in 1900 he attended the Polyclinic of Chicago and took postgraduate work in Vienna. Upon returning he practiced his specialty of eye, ear, nose and throat in Minneapolis from 1900 until 1939.

Dr. Kohler was member emeritus of the Hennepin County Medical Society, the Minnesota State and American Medical Associations. He was a Master Mason of the Watertown Lodge, No. 50, A. F. and A. M., and was a member of the Darius Commandery No. 7, Knights Templar, and an honorary life member in the Zuhrah Temple of the Shrine. He was a member of the medical corps during the World War. He also had membership in the Minneapolis Athletic Club.

Dr. Kohler is survived by a daughter, Louise Kohler

IN MEMORIAM

Hackett, of Minneapolis, and a son, George A. Kohler, Jr., of Lansing, Michigan.

James McCrea

1863-1939

Dr. James McCrea of Fulda died at his home December 19, 1939, after an illness of several months. He was seventy-two years old and had practiced in Fulda fifty-three years.

Dr. McCrea was born at Franktown, Canada, September 25, 1863. He graduated from the Ottawa Normal School in 1885 and taught school in Canada for nine years before studying medicine at McGill University. There he received his medical degree in 1894. The same year he was licensed in Minnesota and South Dakota. He practiced for several months in Salem, South Dakota, and in 1895 went to West Concord, Minnesota, for six months.

On August 1, 1895, Dr. McCrea was married to Emma Schneider of Salem, South Dakota. Dr. and Mrs. McCrea moved to Fulda in March, 1896, and had lived there since that time.

Dr. McCrea had an extensive obstetrical practice and kept abreast of the times. His early practice was in the horse and buggy days when good roads were the exception. He was one of the incorporators of the Citizens State Bank and was active in its management since its incorporation in 1908.

Dr. McCrea was a member of the Southwestern Minnesota Medical Association, the Minnesota State and American Medical Associations.

Owen McKeon

1874-1940

Dr. Owen McKeon, Saint Paul, died at his home, January 4, 1940, on his sixty-eighth birthday, following a heart attack.

Dr. McKeon was born in Henderson, Minnesota, January 4, 1874. He received his medical degree from the Minneapolis College of Physicians and Surgeons in 1900 and received his state license the same year.

After practicing three years in Saint Michael, Minnesota, he moved to Saint Paul, where he continuously practiced his profession.

Dr. McKeon was a member of the Hibernians, Catholic Order of Foresters, Knights of Columbus and for many years a member of the Ramsey County Medical Society and the Minnesota State and American Medical Associations. He was much interested in Boy Scout activities.

Dr. McKeon is survived by his widow, one son, Frank J., of Saint Paul, and two daughters, Gertrude McKeon and Mrs. Phillip A. Delavan of Saint Paul. He also is survived by two brothers, Patrick of Saint Paul and Dr. Philip McKeon of New Richmond, Wisconsin.

Frederick H. Neher

1891-1939

Dr. Frederick H. Neher was born September 9, 1891, in the family home of his father, Frederick Neher, and mother, Anna Koepler Neher, on the West Side of the city of Saint Paul, Minnesota. He received his grade school education in St. Matthew's Parochial School on the West Side, following which he attended St. Thomas High School for four years. His first year of pre-medical work was taken at the University of Minnesota, after which he transferred to Marquette University in Milwaukee, where he received his Doctor of Medicine degree in 1915. He spent a year of internship at the City and County Hospital in Saint Paul, following which he associated himself with Dr. Herbert Davis until he entered the Army shortly after the United States entered the World War in the spring of 1917.

While associated with Dr. Herbert Davis he spent his mornings assisting Dr. Comstock with his surgery. During his service in the United States Army he served in the cavalry, spending a few months at Harvard University in orthopedics. Shortly after the Armistice was signed he was honorably discharged and returned to Saint Paul, renewing his association with Dr. Comstock. After a few years of this association he became an assistant to Dr. Frederick Schuldt of Saint Paul, later leaving Dr. Schuldt to become associated with Dr. Edgar Norris. This association was continued until Dr. Norris was forced to leave practice due to ill health. Following this he was associated with Dr. John Hochfilzer and Dr. H. J. Prendergast. In January, 1931, it was the writer's privilege to become associated with Doctors Neher and Hochfilzer and my association with Dr. Neher continued until his lamentable death.

On July 12, 1922, Dr. Frederick H. Neher was married to Cecelia Kilbane. This marriage was blessed with two offspring, Frederick Neher, Jr., aged fourteen, and James Neher, aged four.

On November 23, 1939, due to an injury sustained to a boil on his arm, he became the victim of a staphylococcus septicemia which necessitated his hospitalization on November 27, 1939, and caused his death on December 6, 1939.

During the many years of my association with Dr. Neher it was my privilege to understand and enjoy his very mellow humor and outspoken frankness in all matters. His jolly pantomime manner in narrating all stories was thoroughly enjoyed by the entire medical profession of this Association. As so tersely stated by a member of our Association, "Dr. Neher was truly more than a member of the medical profession, he was an institution in himself."

He was a member of the American Medical Association, the American College of Surgeons, Minnesota State Medical Association and the Ramsey County Medical Society. He also was a charter member of the Saint Paul Surgical Society and an active member of the Medical Forum in Saint Paul.

EUGENE SCOTT, M.D.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR FEBRUARY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

February 3—Cause of Dyspepsia

February 10—Peptic Ulcer

February 17—Cancer of Stomach

February 24—Periodontia

STATE MEETING

Plans are now being completed, according to the Committee on Scientific Assembly, for the Scientific Exhibit of the 87th Annual Meeting scheduled for April 22, 23, and 24 at the new Mayo Civic Auditorium in Rochester.

Members who have exhibits to submit for this section of the meeting are urged by committee members to communicate immediately with the State Office, 493 Lowry Medical Arts Building, Saint Paul.

There are still a few openings on the Scientific Cinema program, also for motion pictures. Any information about interesting new pictures will be welcomed by the committee.

Three-quarters of an hour each morning and afternoon have been set aside for viewing scientific and technical exhibits, the scientific cinema and demonstrations, and no other sessions whatever will be allowed to interfere during these hours. The splendid facilities available in the Arena of the fine new Auditorium are expected to contribute materially to this section of the program.

Members of the Mayo Clinic staff will stage the entire program for Monday, April 22, including regular scientific sessions, ten Round Table luncheons at the Rochester hotels and an Open House at night in the Arena. Music, entertainment and refreshments will be provided and exhibits will be open for inspection.

Programs for Tuesday and Wednesday, April 23 and 24, are reserved for other state and out-of-state speakers. There will be Round Table luncheons on these days, also, with guest speakers and Minnesota experts acting as leaders on both days. Programs for the general sessions are built around the following subjects: Fractures, Coronary Disease, Radiology, Pre-operative Care, Cancer of the Breast, Progressive Loss of Vision and Child Psychiatry. The last two subjects, scheduled for Wednesday afternoon, April 24, are of especial interest to teachers and school nurses as well as physicians and the final session, accordingly, will be

thrown open to these and other interested outside groups as a climax to the meeting.

The regular Association banquet will take place Tuesday night at the Rochester State Hospital.

Among the outstanding guest speakers who have already accepted invitations to speak at the meeting are: Drs. Paul Magnuson, Harry Mock and Fred L. Adair of Chicago; Bernard H. Nichols of Cleveland; John O. Bowers of Philadelphia and Russell L. Cecil of New York.

Members of the Women's Auxiliary of the Association will hold their annual gathering at the same time, joining with the physicians for the Monday night open house and the banquet.

WASHINGTON COUNTY SOCIETY

The regular monthly meeting of the Washington County Medical Society was held January 9 at the usual time in the Stillwater Club rooms. Considering the weather, the attendance was fair.

A communication from Dr. Chesley on pneumonia typing and serum distribution was read, as was the monthly letter from the Executive Secretary of the State Association.

Two new members, one by card from St. Louis County, Stella L. Wilkinson, M.D., and one by application in the regular way, Carnot H. Sherman, M.D., of Bayport, were certified to by the Board of Censors and the vote for their membership was unanimous. Bernard Street, M.D., was transferred as of January to the State's Institution at St. Cloud, where he will be in charge. With him and his bride go the good wishes of the Society.

William von der Weyer, M.D., of Saint Paul gave a liberally illustrated lecture on "Hip Fractures." He pointed out physiologic reasons for the prevalence of such fractures at certain ages and described the different treatments, surgical and non-surgical, now in vogue. The very marked improvement in the treatment of such fractures has greatly increased satisfactory results, both as to life and restoration of normal or nearly normal functions. He showed and explained the instruments used by himself when surgical treatment is required.

WEST CENTRAL SOCIETY

The West Central Medical Society met in Morris, October 13, 1939. Dr. B. J. Branton of Willmar gave a short talk on malpractice. The society gave him a vote of thanks for his work. Dr. H. E. Richardson of Saint Paul gave a very interesting talk on "Diagnosis of Heart Diseases," and Dr. R. N. Barr from the State Board of Health talked on "Pneumonia: New Methods of Treatment."

Drs. I. L. Oliver, F. W. Behmler and E. M. Elsey were appointed on the fracture committee. Dr. Glesen and Dr. Robert Merrill were appointed to take a course at the University in the "Problems of Premature In-

WOMEN'S AUXILIARY

fants. Drs. L. P. Mooney and F. W. Engdahl were appointed alternatives.

According to a New Year's letter sent to members of this society by the secretary, Dr. Herman Linde, four meetings with an average attendance of fifteen were held during 1939. The present membership is thirty.

Of the original fourteen charter members, when the society obtained its charter on October 21, 1902, six are still active—Drs. Bolsta, Caine, Christensen, Elsey, Larson and Oliver. Four new members joined during the year, and one member was lost through death.—Dr. J. F. Cummings of Morris.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

More than 10,000 papers on the subject, "Youth's Health Security," were written by Minnesota High School students in the Christmas Seal High School Radio project which is conducted under the auspices of the Minnesota Public Health Association and the Women's Auxiliary of the Minnesota State Medical Association.

A total of 102 talks selected as best from the 10,000 were submitted in the state contest. All of these had been presented by the author before local groups.

Writers of the six papers selected as best from the 102 entries presented their talk over WCCO in the final competition. They were Gloria Reel of the Cathedral High School, Saint Cloud; Barbara Zeches of the St. Charles High School, Saint Charles; Alice Hagen of the Washington High School, Brainerd; Ruth Schmiede of the Grand Rapids High School, Grand Rapids; Carl Baumgaertner of St. Thomas Military Academy, Saint Paul; and Corinne Erling of the Aitkin Junior High School, Aitkin.

Finalists who won the school trophies were in the junior contest—Corinne Erling; in the senior contest—Carl Baumgaertner.

Each of the six students who broadcast was presented with a gold medal, a gift of the Women's Auxiliary.

Representing the Auxiliary on the programs given in connection with the project were Mrs. Martin Nordland, Minneapolis, who for many years has been one of the judges in the contest, and Mrs. J. J. Ryan, Saint Paul, vice president, who appeared in place of Mrs. A. C. Baker, Fergus Falls, president, who was unable to attend.

Reports indicate that in some schools every student did research work and wrote a paper on tuberculosis as a part of this project.

Blue Earth County

The Blue Earth Auxiliary held its fall meeting at the home of the president, Mrs. W. C. Stillwell, Mankato. Mrs. George Earl of Saint Paul was a guest. After the regular business meeting Mrs. R. N. Andrews reviewed the play "The American Way." This was fol-

lowed by a social hour with the doctors. About forty members attended.

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Clay-Becker Counties

Members of the Clay-Becker Medical Auxiliary held their winter meeting December 15, 1939, and elected the following officers: President, Mrs. O. O. Larson, Detroit; vice president, Mrs. H. G. Rice, Moorhead; secretary-treasurer, Mrs. L. Plancher, Detroit.

This Auxiliary has been active in sponsoring a sale of articles made by the patients at Sand Beach Sanatorium which netted \$75.85 for the patients. The proceeds are used by the patients for their Christmas spending. The Auxiliary has also placed *Hygeia* in all the county public libraries.

* * *

Red River Valley

Mrs. A. C. Baker, President of the Women's Auxiliary of the Minnesota State Medical Association, attended the joint meeting of the Red River Valley Medical Society and the Women's Auxiliary, which was held in Crookston, Minnesota, December 14, at the Crookston Hotel. Dr. W. L. Burnap of Fergus Falls talked on "The Wagner Bill" at the dinner meeting and Mrs. Baker brought greetings from the State Auxiliary.

Following the meeting, members of the Auxiliary adjourned to the home of Mrs. W. G. Paradis, where Dr. Burnap continued his discussion of the Wagner Bill, and Mrs. C. L. Oppegard reported on the Christmas Seal essay contest. The committee on *Hygeia* is composed of Mrs. S. H. Stuurmans of Erskine, Mrs. W. G. Tanglin of Mahanomen, Mrs. H. Hedemark of Thief River Falls, Mrs. Blegen and Mrs. Allen Sather of Fosston, Mrs. C. G. Uhley and Mrs. J. F. Norman of Crookston. A very interesting report was given showing an increase in subscriptions. A nominating committee was appointed by Mrs. Stuurmans, president, and includes Mrs. L. L. Brown, Mrs. O. L. Bertelson and Mrs. Uhley, all of Crookston.

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Stearns-Benton Counties

Stearns-Benton Auxiliary announces the appointment of Mrs. R. N. Jones, St. Cloud, Minnesota, as their new Publicity and Press Chairman.

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Washington County

The Washington County Medical Auxiliary held the November meeting at the home of Mrs. D. Kalinoff in Stillwater. The business session was followed by an afternoon of sewing for Lake View Memorial Hospital.

The annual Christmas party and meeting were held December 12 at the home of Mrs. R. G. Johnson, Stillwater. Each of the twelve members came dressed to represent a song. After a brief business meeting the afternoon was devoted to games and a visit from Santa. Luncheon followed the meeting.

The January meeting was held at the home of Mrs. E. V. Strand, Bayport, Tuesday evening, January 9, at 7 o'clock. A short business meeting was followed by dinner and the remainder of the evening was spent in a social time. Eleven members attended.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of November 8, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 8, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the president, Dr. Carl B. Drake.

There were sixty-one members and one guest present.

The Secretary read a letter from Dr. Walter R. Ramsey, of St. Paul, making application for transfer of his name from the Active to the Senior Membership list. This had been approved by the Executive Committee. Voted upon and accepted by the Academy.

The scientific program followed.

TOTAL EMBOLISM OF THE RENAL ARTERY and PRIMARY CARCINOMA OF THE URETER

F. E. B. FOLEY, M.D.

Saint Paul

Dr. Foley, of Saint Paul, gave the following follow-up reports on two previously reported cases.

1. This case was originally reported at the April, 1938, meeting of the Academy. The previous report may be summarized as follows. The patient was a very obese woman age 55. She had mitral disease and auricular fibrillation. She was admitted to the hospital January 8, 1938, soon after sudden onset of severe left flank pain. There were transient hematuria, exquisite tenderness in the left flank and albuminuria. The following observations were made two days later: enlargement of the left kidney shadow in the radiograph, normal function, and outlining of the right kidney by excretion urography but no outlining whatever of the left renal pelvis and no function of the left kidney. Cystoscopy showed normal excretion of indigo-carmin by the right kidney but no efflux of urine whatever from the left ureter. By aspiration, 2 or 3 c.c. of urine not colored with indigo-carmin were obtained from the left kidney pelvis by ureteral catheter but there was no continuing drip of urine from the catheter and it appeared quite certain the left kidney was secreting no urine. The left retrograde pyelogram showed a general magnification of the pelvis and calyces corresponding to the enlarged renal outline but no obstruction or actual dilatation of the pelvis. The history and findings appeared to warrant a positive diagnosis of total embolism of the left renal artery. The pain gradually subsided and the further course was uneventful. On March 7, 1938, two months following onset, and April 5, 1938, three months following onset, most of the above observations were repeated and on both occasions a normally functioning right kidney and totally non-functioning left kidney were demonstrated. The retrograde left pyelograms made on these two subsequent occasions showed a marked de-

crease in the size of the left renal pelvis corresponding well with the shrinkage to be expected with progress of an autonephrectomy.

Since the original report the patient has continued under observation. The course has been entirely uneventful. Excretion urography and cystoscopy have continued to demonstrate a normally functioning right kidney and total absence of function of the left kidney. Since the original report April 13, 1938, retrograde left pyelograms have been made on May 6, 1938, four months after onset and on August 2, 1939, one year and seven months after onset. These pyelograms are shown in the following lantern slides. It will be noted that shrinkage of the left pelvis has continued and that in the last pyelogram this has progressed to near disappearance of the kidney.

The case illustrates the fact that with total embolism of the renal artery resulting in aseptic total infarction, autonephrectomy will progress without incident.

2. This case was originally reported at the November, 1938, meeting of the Academy. The previous report may be summarized as follows. The patient was a woman aged sixty-nine. There had been a little vague discomfort in the right flank on occasions. In June, 1938, when she first came under observation, gross hematuria was present during one day. A number of subsequent urine examinations all showed the presence of red blood cells. On pelvic examination a small mass corresponding in position to the terminal portion of the right ureter was palpable. A right pyelo-ureterogram showed a grade 2 hydronephrosis with suggestion of obstruction at the uretero-pelvic junction, no significant dilatation of the ureter but a mottled filling defect occupying a segment 4 or 5 cm. in length in the pelvic portion of the ureter. A diagnosis was made of primary tumor of the pelvic portion of the right ureter. Nephro-ureterectomy, right, and resection of the bladder including the uretero-vesical junction (one stage) were performed on July 6, 1938, and were followed by an uneventful postoperative course. On October 12, 1938, pelvic examination disclosed a small mass in the former position of the terminal portion of the right ureter. Whether this represented induration of the repair process or recurrence of the neoplasm was not certain at that time.

Since the original report, the patient has continued under observation. The mass in the right side of the pelvis gradually became larger and it became evident it represented recurrent growth of the neoplasm. Cystoscopy showed invasion of the bladder floor on the right side. A full course of deep x-ray treatment was administered by Dr. Schons. This does not appear to have had a favorable effect, for, at the last pelvic examination, October 17, 1939, the mass in the right

side of the pelvis was definitely larger and cystoscopy showed further extension in the bladder.

The course in this case is in keeping with the unfavorable prognosis usually found in cases of primary tumor of the ureter. The operation here appeared to be just as adequate as is surgically possible. There appeared to be no extension of the growth beyond the ureter and the ureter separated from surrounding structures with no difficulty whatever. The kidney, ureter and an elliptical segment of bladder wall with the uretero-vesical junction at its center were all excised intact. In spite of this, there is recurrence and certainty of an eventually fatal outcome.

Discussion

DR. ARNOLD SCHWYZER, Saint Paul: As to the first case of total embolism of the renal artery, I would like to have a little more information. When at operation you close the artery by finger pressure, the kidney becomes very much smaller right away. Here the kidney shadow was, in the first x-ray, considerably increased. Furthermore, there was blood in the urine. The question came to me, when I saw the picture, whether that was an embolism of the renal artery or a thrombosis of the left renal vein. The blood from the left spermatic vein enters the left renal vein, which then has to go underneath the superior mesenteric vessels and over the aorta to the vena cava. The venous flow is, therefore, not as free as on the right side. With the vein thrombosed, one could better understand why there was such a very great increase in the size of the kidney.

As to the second case, I wonder whether a second operation and resection would not be possible as long as the histologic picture is not very bad. A good clean excision ought to be possible and it would not be so very difficult.

DR. S. MARX WHITE, Minneapolis: Since I may lay claim to being a reformed pathologist, I might attempt an explanation supporting Dr. Foley's thesis, i.e., that, as the result of total infarction of the kidney, there is first swelling and enlargement of that organ and later contraction with diminution in size. I have had the opportunity to observe at autopsy many instances where large and smaller infarcts have occurred in the kidney. Soon after infarction has occurred the area involved is increased in size and sometimes considerably so. As time goes on this swelling diminishes and the end-result may be a scar of considerable size with pronounced shrinkage in the total mass. The same relations of early swelling and later atrophy can be observed from time to time in the brain. After death of an area in such an organ the cells and tissues imbibe fluids, the mass becomes enlarged, but these fluids are eventually abstracted in the process of organization and scar formation.

I do not recall having seen at autopsy a case of total infarction of the kidney but would expect, when this occurs, that the surrounding tissues such as the renal capsule, the circulation of which might not be involved, would furnish fluids so that swelling of the whole organ should occur similar to that seen in partial infarction. The fact that the kidney was enlarged soon after the original insult would not necessarily speak against the theory that there was infarction. In my mind, it would speak in its favor, particularly since as time goes on a demonstrated shrinkage in this organ has occurred. In my opinion the kidney shown has gone through the typical and expected evolutions.

DR. FOLEY (in closing): I should reply to Dr. Schwyzer's question concerning the diagnosis in the

case of total embolism of the renal artery. The swelling of the kidney does make one consider the possibility of venous thrombosis rather than embolic occlusion of the artery. Dr. White's comments bear directly on the question. It may be that, at the onset, the arterial occlusion is not complete and that at first only branches of the artery are obstructed with multiple infarcts with swelling at their peripheries. On the other hand, with complete arterial occlusion and perhaps ischemic damage to the venules, venous pressure may be sufficient to cause the swelling. One would not expect that venous thrombosis would progress rapidly enough to give such sudden onset of severe pain. Moreover, the proved autopsy cases in the literature correspond perfectly to the one here reported. All things considered, I can't feel there should be much misgiving about the diagnosis of embolism.

In the case of primary tumor of the ureter, I felt that the first operation was just as clean and adequate as possible and now with a recurrent, probably infiltrating, growth, I cannot feel that another surgical procedure in my hands would give any promise of success.

GENITAL TUBERCULOSIS

GILBERT J. THOMAS, M.D.

Minneapolis

Dr. Gilbert J. Thomas, Minneapolis, read his Inaugural Thesis on the above subject. (To be published in full in MINNESOTA MEDICINE.)

Abstract

1. Tuberculosis of the genital tract is a local manifestation of a general disease, and lesions here are most often secondary to a primary urinary tract infection in the kidney. The treatment plan of the local genital lesion or lesions must be based on this pathological fact.

2. The route of spread from the kidney to the genital tract is most often via the urine.

3. The primary lesion in the genital tract is most often the prostate gland. From here the infection may spread to the other genital organs. Foci of tuberculosis in the prostate gland may produce no symptoms.

4. The seminal vesicle is infrequently infected with the bacilli of tuberculosis and is most always associated with lesions of tuberculosis in the prostate gland.

5. Tuberculous infection in the epididymis is secondary in the genital tract to tuberculosis in the prostate gland. There may be a subacute stage of tuberculosis of the epididymis which is activated by trauma.

6. Treatment of lesions of tuberculosis in the genital tract consists of:

(a) The location and arrest of other lesions of tuberculosis and of the primary focus in the urinary tract by whatever means are necessary.

(b) Hygienic treatment of lesions of tuberculosis in the epididymis and heliotherapy to be followed by application of heat, incision and drainage, and surgical removal when indicated.

(c) Orchidectomy is rarely necessary.

(d) Hygienic treatment for tuberculosis of the prostate gland and seminal vesical after removal or arrest of other active foci in the urogenital tract is always

practiced. Surgical removal of these organs is seldom necessary.

(c) Postoperative rest for three months is always essential.

Discussion

DR. W. F. BRAASCH, Rochester: Dr. Thomas has taken full advantage of his opportunities at Glen Lake Sanatorium to study the cases of tuberculosis of the genito-urinary tract. He has made many interesting and valuable observations over a period of years. In the first place, he has called attention to the frequent occurrence of genito-urinary tuberculosis in cases of pulmonary tuberculosis. I was very much interested the other evening, in talking with Dr. Adamson, Director of the Manitoba Hospitals for Tuberculosis, who told me there had been quite a change in the attitude of physicians in this field toward genito-urinary tuberculosis. Careful examination, including guinea pig inoculations and urographic studies, for evidence of coincident genito-urinary tuberculosis is now usually made in cases with pulmonary tuberculosis and it is surprising how often it is found.

Whether tuberculosis in the genitalia is always secondary to renal tuberculosis, as Dr. Thomas states, or whether it may occur independently, has not been definitely proved. It is my opinion that in most instances tuberculosis in the genitalia has its origin by a retrograde route from infection in the urinary tract. Although the area of renal infection may be very slight and may heal spontaneously in some cases, yet a few tubercle bacilli may suffice to find their way from the urethra so as to infect the prostate gland and other genitalia. On the other hand, autopsy has disclosed the absence of renal tuberculosis in the presence of involvement of the prostate and epididymis. It would seem probable that tuberculosis in the genitalia may in some cases be of hematogenous origin.

Dr. Thomas has shown the great value of rest in bed with renal tuberculosis, as in other forms of tuberculosis. There are those who may not agree with him as to the length of time of rest necessary for either pre- or postoperative treatment, but its value must be recognized.

Tuberculosis of the genitalia may be very difficult to diagnose. Clinical statistics as to the incidence of involvement are not very accurate, since a slight tuberculous involvement may exist with little if any clinical evidence. In the course of the usual autopsy it may be easy for the pathologist to overlook tuberculosis of the genitalia. Without careful pathologic examination, including serial sections of all of the genital organs, the data cannot be very accurate. Exact data covering a large series of cases with complete post-mortem examination are still lacking.

Dr. Thomas is very conservative in his views regarding the treatment of genital tuberculosis and I am inclined to agree with him. On the other hand, Dr. H. H. Young believes that the tuberculous prostate gland, seminal vesicles, vas and epididymis should all be removed en masse, and he is supported in this view by men like Hinman. They claim that the postoperative results are distinctly better. The burden of the proof in a large series of cases is up to them. I formerly was under the impression that there was not much difference in the late results after nephrectomy for renal tuberculosis whether the genitalia were involved or not. However, in recent studies my colleague, Dr. Emmett, found that the late mortality in cases of renal tuberculosis was much higher in the male with clinical evidence of genital involvement than in the female. Whether this difference is entirely due to the infected genitalia is, of course, not proven. It is possible that radical surgical treatment might be considered in some cases. However, the danger of rectovesical fistulae and

incontinence, which have been observed, should make one hesitate.

Dr. Thomas is to be congratulated on his thorough discussion of this interesting subject and for his many valuable observations.

DR. F. E. B. FOLEY, Saint Paul: I too wish to compliment Dr. Thomas on the excellent work he has done the past several years in the field of genito-urinary tuberculosis. He has pursued the subject continuously and well, and in this country has been one of the outstanding contributors of clinical data on the subject. The best lesson we can learn from Dr. Thomas' presentation is that every case of genital tuberculosis, particularly epididymal tuberculosis, warrants a complete urologic investigation; for, in the vast majority of such cases, the genital lesion is secondary to a tuberculous renal lesion. To have had that fact, if nothing else, properly impressed tonight, makes Dr. Thomas' thesis well worth while.

DR. RICHARD HULLSIEK, Saint Paul (by invitation): One point that Dr. Thomas called to our attention is the high incidence of prostatic tuberculosis. I think most urologists readily recognize renal tuberculosis and involvement of the epididymis, but we have not looked often for the prostatic tuberculosis. Fortunately, the prostatic involvement often needs only hygienic treatment with the removal of tuberculosis elsewhere in the tract.

DR. F. R. WRIGHT, Minneapolis: To me this entire question is very interesting and comes down to the question of the curability of tuberculosis in general. Wherever you can get at tuberculosis and remove it, well and good; but when it comes to tuberculosis of the prostate, where one can't remove it, what are you going to do? Can you do anything but put that man out in the sun for ten or twelve years and then is he well? The probability is that sometime in the future we will develop a scheme whereby we can take care of constitutional tuberculosis, but, at the present time, that is a long way in the future.

DR. THOMAS (in closing): First of all, I want to thank the men for their discussions.

Dr. Braasch brought up the question of surgical versus hygienic treatment for tuberculosis of the epididymis. I think both methods of treatment are correct. If the patient has lesions of tuberculosis that have been controlled, indicating that his resistance is good, then I think we are justified in removing surgically an organ or tissues if such surgery will erase all remaining evidence of activity. In deciding treatment, we must not forget that tuberculosis is not alone an epididymal or prostatic infection, or a local condition. These lesions are merely local manifestations of a general disease.

Dr. Wright asks whether a patient who has had tuberculosis is ever completely cured. It is a problem with much debate whether a patient having had spread of tuberculosis from the chest cavity is ever absolutely cured. When discussing genital tuberculosis we never use the term "cured" but supplement "controlled" instead. Many patients with bilateral renal tuberculous lesions have had these under control for a great many years without symptoms. We have not found it necessary to remove surgically the seminal vesicles or prostate because, as mentioned above, when this formidable operation is performed, we are not sure that we have surgically removed all of the tuberculosis that the patient may have.

I would like to emphasize another observation, and that is that the manifestations of spread of tuberculosis from the chest cavity responding to surgical treatment are becoming fewer and fewer each year. One urologist in a large eastern city recently told me that

he now infrequently sees renal or genital tuberculosis in his wards. I visited in a city in Texas last fall with a well-known university having a medical department and large hospital. While there, I was unable to present any patients suffering with urogenital tuberculosis for demonstration purposes during my lecture. A final statement concerning treatment is necessary.

No matter where the lesion or lesions are located, if proper treatment of the disease tuberculosis is to be carried out, this must include treatment of the patient "as a whole."

The meeting adjourned.

A. G. SCHULZE, M.D., Secretary.

Meeting of December 13, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 13, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the president, Dr. Carl B. Drake.

There were fifty-four members and one guest present.

The Secretary read a letter from Dr. Franklin R. Wright, of Minneapolis, asking that his name be transferred from the Active to the Senior Membership list. This had already been approved by the Executive Committee, and, upon vote, was accepted.

The following men were elected as officers for the year 1940:

President.....James A. Johnson, Minneapolis
Vice President...John M. Armstrong, Saint Paul
Secretary-Treasurer...A. G. Schulze (relected)

The scientific program followed.

Dr. J. A. Lepak read the following inaugural thesis:

HYPOTENSION, LIKE ANEMIA, DEMANDS AN ETIOLOGIC SEARCH FOR APPROPRIATE THERAPY

An Analysis of 627 Cases

J. A. LEPAK, M.D.

Saint Paul

Although hypotension is not a disease, it is frequently associated with manifestations of a diseased or disordered constitution. Then again, in other instances, its presence reveals no evidence of ill health or loss of body vigor. Consequently, such observations must point to the existence of various types of hypotension. In this presentation, therefore, an effort will be made to give the well-known types of hypotension and to discuss especially the etiologic relation to the coexisting disease or disorder in order that rational therapy might be instituted to correct the disturbing factors. Friedlander¹ states that "there is no single explanation which can account for all types of hypotension. It is not always pathological, and where it is a manifestation of a disease, it may depend upon one of several underlying causes, or upon a combination of them."

In the definition of hypotension differences of opinion are numerous. Oliver² maintains that blood pressure below 125 mm. of mercury should be classed as hypotension, while Janeway³ lowers the reading to 100 mm. of mercury. Alvarez's studies⁴ of blood pressure in a group of 6,000 men and 8,934 women reveal an

average systolic pressure of eleven points lower in women than in men. He also noted a slight drop in blood pressure between the ages of seventeen and twenty-one in men, and seventeen and twenty-five in women. Cadbury⁵ and Kilbourn,⁶ independently, studying blood pressures in Chinese young men, found that the systolic pressure averaged from 20 to 30 mm. of mercury lower than in young Americans or Europeans. It is, then, probably conservative to classify any case as hypotension in which the systolic blood pressure reads not more than 100 mm. of mercury.

Just what the characteristic symptoms associated with or resultant from hypotension are, perhaps no one can definitely state. A certain group of symptoms may be found in one case while in another appears a totally different group. Some individuals remain symptomless, others present only a few symptoms, yet a large number show a long series of complaints. Among the most common symptoms enumerated by Roberts²¹ and Taylor²⁴ which are associated with hypotension are: loss of former sense of well-being, fatigue, physical exhaustion, motor instability, fears, apprehension, nervousness, insomnia, inability to concentrate, inattention, headache, ringing in the ears, generalized neuralgic pains, abdominal pains, falling asleep of the limbs, precordial pain, angina, dizziness, palpitation, faintness and syncope aggravated by exertion, overeating or emotion, susceptibility to colds, cyanosis of the extremities, gaseous distention, psychoneurosis, and menstrual disturbances and irregularities. To some extent, at least, the symptoms are determined by the suddenness or gradualness in the onset of hypotension. Just what mechanical, chemical or functional processes are involved in the production of hypotension with its train of symptoms is not yet fully known.

Yet despite this incompleteness in medical knowledge certain types of hypotension are clinically fairly well recognized. Thus, an acute hypotension sometimes accompanies an anaphylactic, surgical, or traumatic shock or follows a prolonged deep anesthesia. Severe hemorrhages in wasting diseases frequently produce also an acute hypotension. Less formidable hypotension appears in the acute infectious diseases, such as influenza, typhoid fever, or pneumonia. A failing myocardium, either primary or secondary in origin, accounts for many cases of hypotension. Some patients suffering from certain endocrine disturbances show marked hypotension. Essential hypotension attributed by some to the so-called "constitutionally inadequate individual" is

not very rare. Finally, a very small group is limited to orthostatic hypotension with syncope.

Most authors presume that hypotension results from a disturbance in the factors that maintain normal blood pressure. These factors enumerated by Friedlander²¹ are:

- "1. The force of the cardiac contraction.
- "2. The condition of the blood vessels.
- "3. The peripheral resistance to the blood stream, determined by the vasomotor system.
- "4. The blood volume, and the physical state of the blood itself, its viscosity, et cetera."

Inefficiency of the myocardium caused by severe infection, valvular disease, trauma, toxin, or any other such debilitating agent may produce hypotension. The contraction of the blood vessels may compensate to a certain point for the loss of the myocardial force, and for a loss of blood volume. But when the muscle fibers in the wall of the blood vessels are also injured, the muscle becoming flaccid only contributes to a further lowering of the blood pressure. Perhaps the greatest factor in the maintenance of blood pressure is peripheral resistance. It is equally important in the production of hypotension. Arterioles and capillaries, by means of the vasomotor center working in conjunction with the endocrine system, are held in a state of tonic contractions as the vasomotor impulses travel to and fro from the blood vessels. Any agent, thus disturbing the function of the muscles of the blood vessels, the nervous system innervating them, or the endocrine glands stimulating or inhibiting the vasomotor nervous system, may alter the state of the blood pressure. The last factor dealing with the change in the blood volume is particularly important in the production of some forms of acute hypotension. Although contraction of the blood vessels may compensate to a certain point for the loss in blood volume, it cannot meet the situation quickly and completely enough in severe trauma, hemorrhage, or shock to prevent dangerous hypotension. To administer appropriate treatment it is necessary, therefore, to examine as far as possible, in the light of our present knowledge, the various agents, toxic, physical, chemical, functional, et cetera, which either alone or in conjunction with others induce favorable conditions for the production of hypotension.

Temporary or acute hypotension simulates fainting. It follows most frequently an anaphylactic, traumatic or surgical shock. Sometimes a profuse hemorrhage with or without shock plays a very important rôle.

Heidenhain,²² quoted by Friedlander, injecting peptone into the blood stream, produced persistent hypotension with marked concentration of the blood. Pearce and Eisenbrey,²⁰ having confirmed the findings with peptone injections, concluded, from their experimental work on dogs, that anaphylactic shock resembled in many ways surgical shock and that anaphylactic shock and peptone intoxication in their reactions appeared identical. With the introduction of venous therapy, physicians have observed similar phenomena, sometimes following a most innocuous venous injection, which

doubtless must have contained a foreign protein. Anaphylactic shock is said to follow a partial or complete vasomotor paralysis, caused by splanchnic congestion and a subsequent disturbance of the blood volume.

Shock due to trauma received the most studious examination during the late World War by highly trained observers of France, England and America. Their studies showed first that neither injury to the heart muscle nor an exhaustion of the vasomotor center was the primary cause of the low blood pressure. Next, they demonstrated by clinical observations and laboratory experiments that a toxic factor increased permeability of the capillary walls and a consequent reduction of blood volume by the escape of plasma into the tissues. Cannon⁷ adds that after sufficient time has elapsed infection may occur and thus produce persistent low blood pressure, and explains further that there is "no essential difference between the effects of toxins given off by damaged tissue and of toxins resulting from the activity of the bacteria." Experiments of Dale and Laidlaw⁸ and Dale and Richards⁹ with the injection of minute amounts of histamin into animals produced phenomena greatly resembling hypotension in traumatic shock. They concluded that the action of histamin may be reasonably regarded as typifying the action of a large class of protein derivatives—products of partial digestion, of bacterial action and of tissue extraction. Clinical observations on the one hand show that secondary shock does not appear immediately after trauma, and comes also too early for the appearance of a well established infection, hence it can be neither nervous nor bacterial in origin. On the other hand it has been observed most frequently with extensive laceration of the muscles. Moreover, measures favoring absorption, as poor drainage from deeply seated muscle wounds, increase shock, while a check of absorption as by a tourniquet above the wound decreases shock. In addition to the histamin or histamin-like toxic agents, hemorrhage, cold, exposure, and anesthesia may aid also in the production of marked hypotension.

Surgical shock may likewise be divided into primary and secondary shock. Occasionally, a patient possessed with great fear succumbs to primary surgical shock but usually death follows secondary shock. Factors favoring surgical shock are hemorrhage, toxic agents from infection, loss of body fluids from various causes, chilling of the body, tissue trauma, rough handling of the abdominal viscera, and the anesthetic itself. There may be an interplay of several causative factors, but generally it is held that in surgical shock the arterioles are contracted tightly, that the heart contracts strongly and is ordinarily capable of raising blood pressure to a normal level and that the real cause of the low blood pressure is due to the decreased volume of blood in circulation. Accordingly, some observers classify shock as mild, moderate or severe, by the determination of the plasma volume which has left the blood vessels for the tissues. It is apparent, then, that hypotension caused by trauma and surgery with or without anesthesia has one common factor, namely, the loss of blood circulating volume, hence the treatment must be

directed primarily to the supplementing of this shortage of blood volume.

Every effort and measure, of course, ought to be instituted to prevent shock. Primary shock of nervous origin, although infrequent, should be treated without delay by rest, quiet, and nerve sedatives. Blood pressure should not be permitted to drop to a critical level by preventable delay or unnecessary procrastination. Secondary shock, however, demands swift and effective administration of concentrated solutions of glucose, sodium chloride, or gum acacia intravenously if death is to be avoided. Where hemorrhage persists, no measure should be left untried to stop it. Repeated blood transfusions, where concentrated saline and glucose solutions have failed, may save some lives. Application of heat, inhalation of oxygen, and cautious administration of drugs are also considered valuable therapeutic adjuncts.

The second large group of low blood pressure cases is found in the acute infectious diseases. Pyrexia and toxemia, playing the most important part in the production of hypotension, weaken the heart muscle, reduce the tone of the muscles in the blood vessels, and cause disturbances in the peripheral as well as central nervous system. To a certain degree the affections of the heart, blood vessels and nervous systems depend also on the type of infection and the condition of the patient prior to the infection. Some of the most frequent infectious diseases causing hypotension are: typhoid fever, pneumonia, influenza, diphtheria, scarlet fever, cholera, malaria, epidemic cerebrospinal meningitis, typhus fever, and trichinosis. In the advanced stages certain chronic diseases, like tuberculosis, syphilis, diabetes, bronchial asthma, and food deficiency may be likewise very disturbing. Sometimes long-standing focal infections, anemia, cachexia, or a debilitating disorder may cause hypotension.

The treatment of hypotension associated with or following on the heels of an infectious disease, consists largely in ridding the patient of the disease. Wherever possible, specific drugs or sera should be employed. In most cases supportive and symptomatic treatment usually suffices, and after the disease has been terminated for some time hypotension disappears. Some cases, however, retain hypotension either for a long time or permanently and may or may not require a restriction of their activities.

The third group of hypotension results from cardiac weakness or failure. This may come on rather gradually like in valvular disease or suddenly as in coronary thrombosis. Valvular disease as a long-standing mitral stenosis or severe hypertension may, in time, wear down the myocardium and produce secondary hypotension. A large aortic aneurysm without aortic insufficiency not infrequently produces hypotension. Some of the long and frequently recurring paroxysmal tachycardias and bradycardias associated with Stokes-Adams syndrome show either temporary or permanent hypotension. Obesity and long-standing focal infections and toxic states like diabetic coma often produce myocardial weakness with secondary hypotension.

Since hypotension in this group, like in the preceding

two, is relative and is produced entirely by weakness or inadequacy of the propelling force, the treatment must be directed primarily to the strengthening of the myocardium. Rest, digitalis, mild physiotherapy, massage, sun baths, sedatives, and an appropriate diet for individual needs constitute the most commonly employed therapeutic procedures for myocardial weakness. Coronary thrombosis and toxic or infectious myocarditis, each call for its specific line of treatment.

The fourth group causing hypotension is vague and indefinite. It depends on the disorders or disturbances of some of the endocrine glands, among which the best known conditions are Addison's disease, hypopituitarism and hypothyroidism. The hypoadrenalemia, hypoglycemia, and lowered basal metabolism of Addison's disease sometimes cause not only hypotension but also all the symptoms of a mild shock. Friedlander¹¹ calls attention to certain constitutional diatheses commonly associated with cardiovascular, nervous, muscular and glandular hypoplasia or dysfunction. He mentions particularly status lymphaticus, infantilism, myasthenia gravis, and adiposis dolorosa. Body habitus, exposure to high temperature and variations in atmospheric pressure have also a tendency to produce hypotension.

In this group of hypotension the treatment will vary as the agent varies which produces a certain disease, a functional disturbance, or an anatomic abnormality. While Addison's disease may be treated principally with cortin, and hypothyroidism with thyroid extract, some of the less understood conditions naturally will receive treatment which primarily improves health and retards disease and secondarily acts favorably on hypotension.

The fifth, not large but very interesting, group comprises postural or orthostatic hypotension, which results from the abnormal gravitation of blood when the subject is in the erect position. Normally, a change of the body from the supine to the erect position throws an extra strain on the circulation and the organism physiologically adjusts itself by increasing the pulse rate and raising the diastolic while lowering the systolic blood pressure. But in 1925, Eggleston and Bradbury¹² discovered three cases of hypotension which failed to conform to this physiological concept. They suffered from syncopal attacks after or during exertion and sometimes even after standing erect for some minutes. The pulse remained slow and the rate unchanged, the basal metabolism was lowered, perspiration was lacking, and the patients were worse during the summer. The first case in this series is quoted because it shows the unusual blood pressure readings and the accompanying clinical findings quite characteristic of the whole group.

The patient was a male, thirty-eight years old, suffering from "terrible weakness," constant headaches, nocturia, and spots before the eyes. In the lying position the blood pressure read systolic 110, diastolic 65; on standing it fell to systolic 80, diastolic 40 mm. of mercury. After slight exercise there was no dyspnea nor any increase in pulse rate, but in one minute the head fell back, the pupils dilated, slight convulsive movements appeared and, with increased pallor, unconsciousness and loss of radial pulse followed. Then after five

minutes in the reclining position the blood pressure rose to 60 systolic, 40 diastolic mm. of mercury and recovery took place. Blood pressure readings taken on several occasions always showed the lowest values in the standing, slightly higher in the sitting and the highest in the lying position. Having designated these cases as postural hypotension the authors studied the effects of epinephrin, atropin, and pilocarpin, in the lying, sitting, and standing positions, and from the clinical observations and laboratory studies concluded that only a paralysis of the sympathetic vasoconstrictor endings seemed to explain adequately the blood pressure reactions in their cases.

In 1927, Bradbury and Eggleston⁵ reported that two of their patients had died, rather suddenly. The anatomical diagnosis on one of the cases at postmortem was: chronic myocarditis, acute dilatation of the heart, atrophy of the prostate gland, and chronic tuberculosis of the bronchial lymph nodes. As postural hypotension became recognized as a clinical entity, case reports appeared in various sections of the country. Bar and Duggan³ reported postural hypotension in a negro suffering with Addison's disease. Sanders^{22,23} observed it with chronic diarrhea and tachycardia. After reviewing the literature, Barker⁴ recorded a case with numerous laboratory studies. Laubry and Dourne¹⁷ introduced the term "orthostatic" hypotension. Weis²⁵ reported a cure of a case with ephedrine sulphate. Reporting a case with unusual features, Alvarez² states that most cases show:

- "1. Sharp drop in systolic and diastolic pressure with syncope when they stand.
- "2. Failure of pulse rate to increase so as to compensate for drop in pressure.
- "3. Deficient sweating and inability to stand hot weather.
- "4. Secrete large volumes of urine at night.
- "5. Additional features frequently, such as appearance of youthfulness, lowering of basal metabolism, signs of slight changes in the nervous system, loss of sexual desire, and concentration of blood urea around the upper limit of normal."

Ghrist and Brown²² contend that the splanchnic vessels lack resistance, and the vagal cardiac regulatory mechanism is deficient in failing to increase the heart rate to compensate for the alterations in blood pressure. Others following the hypothesis of MacWilliam¹⁸ assign the disturbing agent to the lower extremities. Doubtless the vasomotor system plays the principal part in the production of postural hypotension, but as long as the physiological processes remain unknown or only partially worked out, theories regarding the cause will be constantly increasing.

In treating orthostatic hypotension every effort should be exerted to maintain blood pressure above the level which produces undesirable symptoms when the patient is erect. Among the drugs found most useful in the treatment of postural hypotension were ephedrine sulphate, benzedrine sulphate, ergotamine tartrate and paredrine hydrobromide. Ghrist and Browne²² reported

a cure with ephedrine sulphate. Horton and Brown,¹⁴ after experimenting with various medications, combined ephedrine sulphate with paredrine hydrobromide and thus obtained the most satisfactory results. When postural hypotension is better understood, unquestionably the treatment will be also more efficacious.

The sixth group embraces essential hypotension, a syndrome whose chief objective finding is marked hypotension. Among the symptoms listed are exhaustion, nervousness, headaches, pains in the chest, abdomen or extremities, indigestion, constipation, backache, dyspnea, insomnia and palpitation. Not infrequently such patients are diagnosed as neurasthenics, psychasthenics or psychoneurotics. They are individuals usually between the ages of twenty and forty and the condition is at least twice as common in women as in men. There is a lack of the usual stamina necessary to meet the daily routine of life. Among the theories advanced to explain essential hypotension are an asthenic type of individual, status lymphaticus, autointoxication, decreased oxidation, constitutional inferiority, preceded possibly with endocrine disturbances or post-infectious exhaustions or toxemias, storage of excessive quantities of blood in the splanchnic vessels, and capillary stasis due to histamin or histamin-like bodies. Although medical writers disagree on the theory of causation, they all agree that the individuals lack necessary endurance, mental, physical and emotional. As long as they are sheltered and, either by accident, circumstance or design, prevented from unusual strain and stress of modern civilization, their limited constitutional capacity operates smoothly and satisfactorily. When ambition stimulates them to compete with the robust type, or occupational worries, familial disturbances, domestic wrangles, or financial reverses place an additional strain on the constitution, a marked depreciation in health results.

In the treatment of essential hypotension it is necessary to recognize the subnormal physical, mental and emotional strength of the individual in order to regulate his activities, choose an occupation, select a diet, insist on rest and prescribe drugs to maintain or increase his vigor instead of employing measures which might tear down or destroy it. Such treatment is always difficult and painstaking. Essential hypotension found in the fairly robust type resulting from overwork or some acute infection, responds to treatment more readily than the former.

Comment

Hypotension in the light of our present knowledge might be regarded as a symptom of some known or unknown causes, sometimes predictable and many times unpredictable. Clinical, laboratory, and experimental evidence favor a theory of multiple and sundry causes rather than one and unique for the production of hypotension. Whether the constant accumulation of knowledge may unearth one single initiating, directing or guiding link in the long chain of causes held today, remains a moot question for the future. Any classification of hypotension in recent years is unsatisfactory because frequently cases in one group overlap with

another when they manifest similar or identical characteristics. And to complicate the picture still further, many of the symptoms and findings attributed to hypotension are observed in perfectly normal individuals or even sometimes in cases of hypertension. It is safe to say, however, that the disturbance or failure of two factors—the heart or driving force and the vasomotor controls—account for hypotension in the majority of cases. Other factors, like hemorrhage or loss of body fluids, are of relatively rare occurrence and from the numerical standpoint negligible. Endocrine dysfunction, toxemias (endogenous or exogenous) and infections with their toxins are important in the production of hypotension only in so far as they depress cardiac or vasomotor action and when compensatory functional mechanisms, such as increased pulse rate, or rising blood pressure, do not appear. In recent years, operations performed on the sympathetic nervous system, such as bilateral ramisection, ganglionectomy, bilateral vascular sympathetic neurectomy for hypertension and vascular crises, as Raynaud's disease or erythromelalgia, have given not only satisfactory results but have proven also that blood pressure is actually controlled by the sympathetic nervous system. It is apparent, then, that the most important single factor in the production of hypotension is a disturbed vasomotor control.

Conclusions

1. Hypotension is a symptom.
2. For practical purposes, especially for treatment, six groups are proposed on a more or less recognized etiological basis. These are:
 - a. Hypotension due to shock (trauma, surgery, anesthesia) causing peripheral nerve-paralysis and treated largely by introduction of concentrated solutions intravenously.
 - b. Hypotension in acute infectious diseases caused by toxins acting upon the whole organism but especially on the myocardium and treated by supportive therapy.
 - c. Hypotension resulting from myocardial insufficiency due to long-standing causes, like valvular disease or hypertension, and treated by supporting the myocardium.
 - d. Hypotension encountered in endocrine dysfunction or constitutional diatheses and treated by specific or pluri-glandular replacement therapy.
 - e. Hypotension (orthostatic) discovered only recently and resulting from abnormal gravitation of blood when the subject is in the erect position and treated best by large doses of ephedrin sulphate and paredrine hydrobromide.
 - f. Hypotension (essential) found in relatively well individuals, frequently without any complaints due to constitutional deficiencies and either not treated or treated only symptomatically.
3. An analysis of 627 cases of hypotension in the first examination at the office in regard to presenting complaints, family history, age, sex, tuberculosis, social

state, operations, past history, infectious diseases, occupation and final diagnosis indicates that modern stress and strain in undermining the vegetative nervous system plays a major part in the production of hypotension.

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Discussion

DR. ALBERT SNELL, Rochester: Dr. Lepak has mentioned the importance of blood volume in the maintenance of normal arterial tension. This fact is well exemplified by the course of patients who have Addison's disease. During periods of crisis, the blood pressure falls to extremely low levels, chiefly owing to hemoco-concentration and a decrease in blood volume. Administration of the synthetic cortical hormone, desoxycorticosterone acetate, produces retention of salt and water and, if used in a dosage larger than necessary, there may be a sufficient increase in blood volume to produce actual hypertension. In fact, cardiac dilatation and acute cardiac failure may be induced by this means in cases in which Addison's disease is present. The relation of blood volume to blood pressure has not been extensively studied in all types of hypotension, but, certainly, the importance of normal blood volume in this group of patients may well be greater than was formerly believed.

LYMPHOSARCOMA OF THE STOMACH AND BOWEL*

Report of Two Cases

JAMES A. JOHNSON, M.D.

Minneapolis

Lymphosarcoma of the gastrointestinal tract is a relatively uncommon disease. In 1932, Ullman and Abeshouse⁶ reported that there were 375 cases of the small and large intestine. In March, 1939, Madding⁴ reported that there were 428 cases up to 1938 of all types of sarcomas of the stomach and collected sixty-seven additional cases from the Mayo Clinic, 81 per cent of them classed as lymphosarcomas. Collins¹ states that sarcomata comprise about 1 per cent of all neoplasms of the stomach. In comparison with the stomach and colon the small intestine is relatively free from malignancy. Lymphosarcoma, however, is probably found as frequently as any other form of malignancy in this locality. This is especially true in the ileum.

Statistics are undoubtedly quite unreliable because of the confusion which arises as to its terminology. Ewing² has given a most comprehensive discussion of this subject in the February, 1939, Bulletin of the New York Academy of Medicine. Any one who desires detailed information should read his article. Lymphosarcoma is often reported as sarcoma of either the large or small cell variety. It is often mentioned as intestinal Hodgkin's disease, malignant lymphocytoma or lymphoblastoma. These distinctions are probably only of academic value, at least as far as the clinician is concerned. It has, therefore, often been suggested that the general term of lymphoblastoma be used to obviate the confusion.

The etiology of lymphosarcoma is as obscure as it is in all other malignant diseases. Trauma has often been mentioned in individual reported cases, but it is usually difficult to establish any definite relationship. Ewing states that subacute bacterial infection stands as one of the common excitants of lymphatic tumors. There is perhaps some irritant present that incites cell growth, but the cause awaits further development, as is the case in all malignancy.

Lymphosarcoma of the gastrointestinal tract is most common in the first, third and fourth decades of life, the average age being about forty years. The average age in Ullman's series of intestinal cases was 33.19 years, males showing a preponderance of 5 to 2. It is most frequent in the white race. The average age of gastric cases reported by Madding was forty-six years. Males were affected in a proportion of 6 to 1.

Lymphosarcoma in the stomach and intestine appears either as an annular or polypoid growth. The annular or infiltrating type is more common. It begins in the lymphoid tissue of the submucosa and spreads laterally into the muscular layers, which it gradually replaces with a hard infiltrating growth. The growth appears as a subserous tumor which usually does not penetrate through the serosa but often invades the mucosa and causes ulceration. The tumor is of a firm

consistency and often has an irregular contour. In the stomach it may resemble diffuse carcinoma, the so-called "linitis plastica." It spreads by direct extension into the adjacent lymph nodes and later to distant organs either by lymphatic or blood channels. It occasionally perforates. Lewis³ found only six instances of perforation out of 400 reported cases.

The diagnosis is rarely made before operation. There are no classical signs or symptoms by which it can be recognized. The symptoms are usually of an obscure nature and consist of an indefinite gastric or abdominal distress, depending largely upon ulceration of the mucosa or obstruction to the lumen for their localization. A secondary anemia together with moderate leukocytosis is usually present. Roentgen examination is the greatest aid to diagnosis. The gastric rugæ are decidedly enlarged, suggesting a marked submucosal infiltration, much resembling an advanced hypertrophic gastritis. The general picture is that of a gastrointestinal malignancy and that is the usual preoperative diagnosis.

Treatment consists of surgery and x-ray therapy. It represents much the same problems as any other malignancy. Lymphosarcoma, unfortunately, does not produce as early obstruction and ulceration in the gastrointestinal tract as does carcinoma, and is, therefore, usually more advanced. It metastasizes early and widely into the surrounding glands and the result is, therefore, less favorable. If the lesion can be recognized early enough to permit a thorough removal, the eventual result will no doubt compare favorably with other malignancies.

Case Report

Case 1.—Mrs. L. B., aged fifty-six, housewife, came to the office on August 8, 1939, referred by her family physician, Dr. F. R. Huxley.

Past history: She had had typhoid fever during childhood. During the past ten years there had been recurrent attacks of abdominal pain of short duration.

Present illness: During March, 1939, she had an attack of influenza and since then had not been well. She began to notice epigastric distress after meals which had gradually increased until at the time of her examination it was very severe and she often vomited before there was any relief. Recently, the stools had been loose, often three to five stools daily. There had been a weight loss of 15 pounds the past five months.

Physical examination: Revealed considerable loss of weight with pallor. A hard mass could easily be palpated in the epigastrium. The abdomen was slightly distended. The heart and lungs were normal; blood pressure was 100 systolic, 70 diastolic.

Laboratory findings: Urine negative; hemoglobin 55 per cent; red blood cells 3,700,000; leukocytes 13,200 with 81 per cent polymorphonuclears; Kolmer and Kline negative. No gastric contents were examined because of her fear of this procedure.

X-ray examination: Revealed a large lesion of the stomach involving two-thirds of the pyloric end with 25 per cent retention at the end of six hours. The diagnosis was advanced carcinoma of the stomach, probably operable.

Operation (August 20, 1939): General anesthesia. On opening the abdomen there was found a large growth involving almost the entire stomach. The adjacent glands on the lesser and greater curvature were extensively involved. There were several enlarged glands

*From the Department of Surgery, The Nicollet Clinic, Minneapolis, Minnesota.

in the mesentery of the small bowel. The liver and remainder of the abdomen were free. I decided to remove the growth so that she could eat in comparative comfort as long as she lived. An extensive removal was done, leaving only a small pouch to which the jejunum was anastomosed by the Polya method. An entero-anastomosis between the two arms of the jejunum was then made. Five hundred cubic centimeters of blood and 1000 c.c. of 5 per cent glucose in normal saline were given intravenously during the operation.

Post-operative condition: Uneventful until the third day, when she developed a generalized edema. This was probably a salt retention edema enhanced by her anemia. There was also a circulatory factor. She was given several intravenous injections of 10 per cent glucose in distilled water together with a blood transfusion and digitalis. The edema had disappeared in four days and the remainder of her convalescence was normal.

Pathological report: Gross: There is a massive tumor involving about two-thirds of the mucosa of the resected portion of the stomach. This tumor is thrown up into enormous folds which roughly resemble normal gastric rugæ. There is ulceration at several points. The wall is about 1.5 cm. in thickness and the muscular layer is visible at the base of the tumor. The peritoneum is heavily infiltrated with large thick plaques. In the attached mesentery there are soft yellow white lymph nodes ranging up to 1.5 cm. in diameter.

Microscopic sections: Show a massive infiltration by small round cells, endothelial cells, eosinophiles and polymorphonuclears. This is present both in the gastric tumor and the lymph nodes. Because of the variation in the size and form of the cells, leukemic infiltration is improbable and by exclusion the diagnosis of lymphosarcoma or Hodgkin's is made.

The picture corresponds to the condition previously classified as lymphosarcoma.

Result: She returned to her home on September 24 with instructions to come back after a short convalescence for x-ray treatments. About three weeks later her family physician, Dr. Huxley, telephoned that she had become deeply jaundiced. She died on November 1, apparently from a rapid extension of the growth.

Comment: During the operation it was found that there was massive infiltration about the head of the pancreas and bile ducts. The tumor growth evidently progressed rapidly and caused an obstructive jaundice.

Case 2.—Mr. H. M., aged sixty-seven, a retired farmer, came to the office August 22, 1939, referred by his family physician, Dr. A. W. Sommer.

Past history: Typhoid fever at the age of twenty, appendectomy at twenty-two. Gastric distress eighteen years ago relieved by diet and medication. Otherwise general health had been good.

Present illness: During the past five months he had noticed epigastric distress with some distention. The past two months pain had localized in the left upper abdomen and was most severe directly after eating. There had been some nausea but no vomiting. He had lost twenty pounds the past five months. One week previous to my seeing him he first noticed a lump in his left upper abdomen.

Physical examination: A poorly nourished man with a hard irregular mass the size of a fist in the left upper abdomen. The mass was freely movable from side to side. The spleen could be felt separately and was not involved in the tumor. Lungs and heart were normal; blood pressure 124 systolic, 70 diastolic.

Laboratory findings: Urine and Wassermann negative; hemoglobin 59 per cent, red blood cells 4,560,000

—deformed cells; leukocytes 13,800, differential white cells normal.

X-ray examination: The stomach and colon were normal. The mass was located in the jejunum. There was partial obstruction and some barium was retained in the tumor. A diagnosis of jejunal tumor was made and operation advised.



Fig. 1. (above) Lymphosarcoma of stomach, showing diffuse infiltration of the wall together with extensive involvement of the mucosa with ulceration.

Fig. 2. (below) Specimen of jejunum with wall and lymphatic glands extensively involved.

Operation (August 25, 1939): Left upper rectus incision. A large diffuse infiltrating tumor was present in the upper jejunum. About 30 inches of the bowel and mesentery were extensively involved with an infiltrating growth. The infiltration extended to the base of the mesentery and beyond. There was no evidence of distal metastasis. The entire growth including a wide area above and below was excised. The mesentery was removed down to its junction with the posterior wall. The growth extended beyond this point behind the peritoneum and could not be completely excised. The growth was high on the jejunum and there was just room enough for a side-to-side anastomosis. He was given a 500 c.c. blood transfusion following the operation.

Post-operative: Except for a slight cold his recovery was normal. He left the hospital on the eighteenth day to return later for x-ray treatment.

Pathological report: Gross: The specimen consists of a long segment of bowel and its mesentery. The bowel wall at several points is over 1 cm. in thickness. The entire segment is infiltrated by a grey diffuse tumor which is located principally in the peritoneal and muscle layers. At numerous points the mucosa is also

involved and a few of these areas are ulcerated. The mesentery is involved by masses of grey lymph nodes which are fused together, producing shortening of the mesentery and adhesions of the bowel loops. The mesenteric mass at one point is about 4 inches in diameter.

Microscopic sections: Sections of the bowel and nodes show that they are completely destroyed by a growth of round lymphoid cells. Mixed with these are larger endothelial-like cells together with leukocytes, both polymorphonuclears and eosinophiles.

Diagnosis: Lymphoblastoma of the bowel and mesentery. The term lymphoblastoma is a general one applied to this group of diseases. The term lymphosarcoma is the one in most common usage.

Result: On October 24, 1939, he returned for deep x-ray therapy. He stated that he was feeling fairly well and had no pain or distress. He was able to take a general diet and gained a little weight. The secondary anemia showed improvement.

Comment: The growth had extended deep into the retroperitoneal glands, which could not be removed. His relief, therefore, will only be symptomatic and will depend on the rapidity or slowness of growth of the remaining tumor.

Conclusions

1. Lymphosarcoma of the stomach and bowel is a comparatively rare disease. It occurs often enough, however, so that the surgeon should be constantly on guard and not fail to recognize its presence. It is with this in mind that I have reported in detail these two cases.

2. The etiology is unknown.

3. It begins as a local disease in the lymphoid tissue of the submucosa and spreads to infiltrate all the layers.

4. The treatment is the same as that of any malignant neoplasm.

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Discussion

DR. ALFRED HOFF, Saint Paul: It may be of interest to cite a case I first saw in 1932 and followed for seven years until her death in 1939. This patient, fifty-seven years old when first seen, complained of pain in the left side of her abdomen. X-ray studies after a barium enema revealed a constant filling defect in the cecum. Malignancy was considered probable and a cecal resection was done by Dr. A. R. Colvin. The tumor found in the cecum had a convolutions-of-the-brain appearance and the microscopic diagnosis was lymphosarcoma.

Three years later this patient developed a chyloid effusion and an indefinite nodular mass appeared in the abdomen. About this same time palpable discrete lymph glands were found in the groin and axilla. The spleen and liver were not palpable.

From this time until her death four years later she was rarely confined to bed, although dyspnea on moderate exertion became increasingly evident.

During all of this time repeated blood examinations, except for a moderate anemia and leukocytosis with a neutrophilia, were not significant.

No x-ray therapy was attempted.

A complete blood study made on the day preceding her death failed to show any signs of immaturity or changes indicating the leukemia which was found at autopsy.

DR. A. R. COLVIN, Saint Paul: The case reported by Dr. Hoff, in connection with Dr. Johnson's case reports, presented some points not referred to by Dr. Hoff. The patient had complained for years of abdominal pain and in the course of Dr. Hoff's examination he discovered with radiography a fairly large stone in the left kidney. Pyelogram revealed a marked dilatation of the calices with retention of the contrast medium for several days. I may say that the kidney condition was ignored for the time-being because of the presence of a palpable tumor in the cecal region; radiography revealed a filling defect in the cecum. Operation was undertaken because of the possibility of carcinoma of the cecum. At the operative exposure it was remarked that the tumor did not have the feel of what we are accustomed to find in carcinoma of the large bowel, but felt like a diffuse uniform enlargement extending well up into the ascending colon. On removal of the colon well on into the transverse, the mucous membrane was uniformly thickened and presented a wavy appearance. There was no glandular enlargement. Strange to say, she had no more pain after recovering from the operation, although the stone in the kidney was not disturbed and she had a marked hydronephrosis. The stone and hydronephrosis was found also at autopsy. Dr. Hoff has told you she lived six years. Her death was due, as Dr. Hoff has told you, to a generalized pseudo-leukemia. Preceding her operation, she had remarkably few gastrointestinal symptoms.

I suppose the question might be raised whether a condition such as was found in her colon required surgery. It is possible that she might have lived just as long without operation, but perhaps in a similar case one would again be uncertain as to the condition found at exploration in the absence of glandular enlargement, as in the case reported.

Dr. Johnson's cases are reported as lymphosarcoma. The large group of conditions including pseudo-leukemia, lymphosarcoma, Hodgkin's disease and lymphomatosis are at times very difficult of differentiation clinically and perhaps this is true histologically.

The next case was perhaps even more confusing. A woman of fifty-four complained of persistent nausea and occasional vomiting, in the presence of tachycardia, a basal metabolic rate of plus 40, and a fairly marked bilateral enlargement of her thyroid gland. Hyperthyroidism was a probability and still the clinical picture was lacking in some of the elements of hyperthyroidism. The patient did not look like a toxic goiter complex. Radiographic study of the stomach was negative.

The thyroid enlargements felt much firmer than any of the usual enlargements. Riedel's granuloma was thought of but, at operation, on incising the gland it lacked the tough fibrous condition found in Riedel's granuloma. The cut surface resembled that of a firm sarcoma. Subtotal removal was done, and, although immediate recovery was satisfactory, the patient died in about three months. At autopsy, a pseudo-leukemic infiltration of the submucosa of the entire stomach was found, the mucous membrane being thrown into coarse wavy folds very much like that seen in the colon of the other case. There was a firm nodule about the size of a large bean in the wall of the small intestine, and a similar one in the wall of the left ventricle; there was quite an amount of milky fluid in the peritoneal cavity.

Here, then, we have a generalized disease presenting local lesions confusing as to interpretation. The disease is a generalized one and always fatal. The increased basal metabolic rate is perhaps always present and should call attention to a condition in which surgery is only temporarily helpful.

DR. HERBERT JONES, Minneapolis: I would like to ask Dr. Johnson what the effect of the x-ray was on this growth?

DR. JOHNSON: It is only about six weeks since he completed the x-ray treatments and not enough time has passed to notice any changes. I believe it is quite generally recognized that x-ray treatments of this type of tumor are often followed by favorable results for a considerable period of time.

DR. J. A. LEPAK, Saint Paul: I had a case with this condition and the operation was performed by Dr. Arnold Schwyzer. He opened the abdomen, recognized the condition by its gross pathology, and simply closed it. The case then received x-ray treatment and has been perfectly well for three years.

The meeting adjourned.

• A. G. SCHULZE, M.D.
Secretary

The Negro and the City

Cities are relatively much more destructive to Negroes than to whites in their effects on mortality from tuberculosis and acute respiratory infections. Under present conditions mortality from respiratory diseases acts as a powerful check to the natural increase of the Negro in northern latitudes. Holmes, S. J., Amer. Jour. Med. Science, 1938, 195.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

INTRODUCTION TO GASTRO-ENTEROLOGY. Third Edition of The Mechanics of the Digestive Tract. Walter C. Alvarez, Professor of Medicine, University of Minnesota, the Mayo Foundation, and Senior Consultant in the Division of Medicine, Mayo Clinic. 778 pages. Illus. Price, \$10.00, cloth. New York: Paul B. Hoeber, 1940.

CANCER OF THE BREAST AND CANCER OF THE UTERUS. Second Edition. Marion Ellsworth Anderson, A.B., M.D. 106 pages. Illus. Price, \$3.50, cloth. Clinton, Iowa: Franklin Press, 1939.

POPULATION, RACE AND EUGENICS. Morris Siegel, M.D. 206 pages. Price, \$3.00, cloth. Hamilton, Canada: Dr. Morris Siegel, 1939.

LANE MEDICAL LECTURES: VIRUSES AND VIRUS DISEASES. Thomas M. Rivers, M.D., Sc.D., Director Hospital of the Rockefeller Institute for Medical Research, New York City. 133 pages. Illus. Price, \$2.50, cloth. Stanford University, California: Stanford University Press, 1939.

MANUAL OF FRACTURES, DISLOCATIONS AND EPIPHYSEAL SEPARATIONS. Harry C. W. S. de Brun, M.D., F.A.C.S., Adjunct Professor of Surgery, New York

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

Polyclinic Medical School and Hospital; Associate Visiting Surgeon, Swedish Hospital, Brooklyn; Consulting Skeletal Surgeon, New York Police Department, etc. 468 pages. Illus. Price, \$3.00, cloth. Chicago: Year Book Publishers, 1940.

MEDICAL EDUCATION IN THE UNITED STATES, 1934-1939. Council on Medical Education and Hospitals, American Medical Association. 259 pages. Paper cover. Chicago: American Medical Association, 1940.

HANDBOOK OF ORTHOPÆDIC SURGERY. Alfred Rives Shands, Jr., B.A., M.D. Medical Director of the Nemours Foundation, Wilmington, Del.; Associate Professor of Surgery in Charge of Orthopædic Surgery, Duke University School of Medicine, Durham, N. C. 567 pages. Illus. Price, \$4.25, cloth. St. Louis: C. V. Mosby Co., 1940.

THE PATIENT'S DILEMMA. The Quest for Medical Security in America. Hugh Cabot, M.D. 284 pages. Price, \$2.50, cloth. New York: Reynal & Hitchcock, 1940.

DON'T EAT BREAD. Allen Klein, Ph.G. 116 pages. Price, \$1.00, cloth. Emmaus, Pa.: Rodale Press, 1939.

PRIMER OF ALLERGY. Warren T. Vaughan, M.D., Richmond, Va. 140 pages. Illus. Price \$1.50. St. Louis: C. V. Mosby Co., 1939.

This book is designed, one might say, as a companion volume to the "Practice of Allergy," which we reviewed earlier. The latter is a text designed for physicians. The "Primer" is designed to explain to laymen the concepts of allergy.

There are some sections on general instructions which should prove distinctly helpful. In general, however, it is my impression that the book attempts to be too complete, with the result that the average lay reader, when he has finished the first hundred pages, will feel almost as confused as when he started. For those patients interested in as complete an understanding as possible of our present knowledge of allergy the book will prove distinctly interesting.

On the whole one might wish a volume about one-half the length and about one-half the complexity. The few illustrations give one the idea that a volume making all its points with numerous pictures might be more effective than a volume indulging in considerable verbiage.

ASHER A. WHITE, M.D.

DISEASES OF THE CORONARY ARTERIES AND CARDIAC PAIN. Robert L. Levy, M.D. 445 pages. Illus. Price, \$6.00. New York: The Macmillan Co., 1936.

Unfortunately, this book was not presented for review when first published. However, a review at this time must not be considered as unsatisfactory because of the lapse of three years. In fact, the list of contributors is sufficient assurance of the value of the work as edited by Robert Levy. Men were selected who were outstanding in their fields to write the various chapters; for example, anatomy being described by Wearn, physiology by Wiggers, pharmacology by Fred Smith, and pathology by Von Glahn. Levy, Kerr, and Wilson contribute a discussion on the clinical data of coronary disease and its complications. The medical treatment is ably handled by Levy himself. There are also appended several interesting chapters on the sur-

gical treatment of diseases of the coronary arteries, including a contribution by James C. White on paravertebral alcohol injections and other measures for the relief of cardiac pain; Beck's surgical treatment for the development of a new blood supply to the heart; and a discussion by Blumgart on his results with total thyroidectomy for the relief of cardiac pain and congestive heart failure.

F. J. HIRSCHBOECK, M.D.

EYE, EAR, NOSE, AND THROAT MANUAL FOR NURSES. Roy H. Parkinson, M.D., F.A.C.S., oculist and aurist to St. Joseph's Hospital, San Francisco, Calif. Fourth edition. 243 pages. Illus. Price, \$2.25. St. Louis: C. V. Mosby Co., 1939.

This volume gives the subject matter briefly, yet with remarkable clearness and completeness. The material is arranged skillfully and the illustrations are well selected.

D. L. TILDERQUIST, M.D.

TUMORS OF THE HANDS AND FEET. Edited by George T. Pack, B.S., M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Yale University, School of Medicine and Cornell University, College of Medicine. Price \$3.00. 138 pages. St. Louis: C. V. Mosby Company.

This little volume is a reprint of a symposium on this subject which appeared in the January, 1939, issue of *Surgery*. There are a number of collaborators who assemble the present knowledge of the subject in very convenient form. The book is well illustrated and well indexed and has a complete bibliography. It should be useful both for the purpose of getting up to date information on the subject and also for reference.

GORDON C. MACRAE, M.D.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from Page 130)

he was born in Denmark in 1863, and that he has been in this country forty years. He holds no license to practice any form of healing in the State of Minnesota, and stated that he has a diploma in mechano-therapy from the American College of Mechano-Therapy at Chicago, dated November 18, 1908. He has lived in Minneapolis for about twenty years and has represented himself to the public as a naturopathic physician. At the time of his arrest he was representing himself as a physiatric specialist in women's ailments. Prior to residing at the Humboldt Avenue address, Visholm practiced at Portland and Lake Streets and at 1700 West Lake Street. Visholm, when questioned by Judge Reed about practicing without a license, stated to the Court that the naturopaths had attempted on four occasions to have naturopathy recognized by the Minnesota Legislature, but that the bill had been defeated each time.

The Minnesota State Board of Medical Examiners approves of the disposition made of this case due to the defendant's advanced age, and because of his frankness in acknowledging his guilt at the time of his arrest, and other circumstances connected with the case. The Medical Board also wishes to acknowledge the very prompt and splendid work done in this case by the Women's Bureau of the Minneapolis Police Department, and particularly by Lieutenant Blanche Jones, head of the Bureau, and Mrs. Carrie Bystrom and Miss Gladys Cooke, policewomen.

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CESAREAN SECTION*

A Brief Historical and Technical Review

L. W. BARRY, M.D.

Saint Paul, Minnesota

ACCORDING to Greek mythology, Bacchus⁵⁸ was taken from the dead body of his mother, Semele. Æsculapius was born in a similar manner. Among the Romans, Pliny⁵² mentions that Scipio Africanus and Manilus were born in this way. Numa Pompilius,² the second king of Rome, decreed that no pregnant woman should be buried until the fetus had been extracted by abdominal section. Julius Caesar⁷⁰ was supposed to have been born by a cesarean operation, thus its name; but this is unlikely as at thirty he stated his mother Aurelia was still living. The Italian³¹ laws also made section obligatory, probably due to the warm support of the Roman Catholic Church. In the middle of the eighteenth century, the king of Sicily issued the death sentence against a physician for failure to perform the operation on a dying mother.

Buddha²¹ was supposed to have been delivered from the right flank of his mother. Among the Jews,⁴⁴ according to the Mischnejoth written about 140 B. C., the operation was practised on the living mother. Their Talmud describes two types of operation: the "kariyath habbeten" corresponding to our classical cesarean; and the "yozay dofan" or delivery through the flank. The ancient Egyptians⁶⁰ depicted the operation in their sculpture.

The earliest account of the operation in any medical work is in the *Chirurgis Guidonis*⁵¹ de Cauliaco published in the middle of the fourteenth century (1363). The first authentic case of operating on a living woman was in 1491.⁵¹ Nufer⁵¹ operated in 1500. In 1581, Rousset⁵¹

published a work on the subject, reporting a series of fourteen successful cases. That Shakespeare was familiar with the operation is evidenced by his lines in *Macbeth* where he states that:

"Macduff was from his mother's womb
Untimely ripped."

Pickrell⁵¹ states: "Whatever may have been the origin of the word 'cesarean,' the operation was first called 'cesarean section' by the Jesuit, Theophile Raynaud, in his work '*Deortu infantium contra naturam, per sectionem Cæsarem*,' 1637."

From Shakespeare's time to 1876 the maternal mortality was fearful. Kayser⁵⁵ (Copenhagen, 1844) found a death rate of 62 per cent in eighty years. In 1871, Harris⁵⁵ of Philadelphia collected fifty-nine cases with a 48 per cent mortality. In Great Britain⁵⁵ only four women out of thirty-eight operated on between 1739 and 1845 survived. In France, Gueniot⁵⁵ reported that in Paris only six women survived the operation in the eighteenth century and in the first sixty-nine years of the nineteenth century none survived.

The first authentic cesarean section in the British Isles was performed successfully on Alice O'Neal in 1738 by Mary Donnally,⁵¹ an illiterate midwife. After several attempts to deliver the patient from below, she performed a cesarean with a razor. The incision was to the left of the navel, one inch above and six inches below. She sewed the abdominal wound together with a tailor's needle and common silk, and dressed the wound with a white of an egg. Twenty-three days later the patient was able to walk a mile.

*Thesis read before the Minnesota Academy of Medicine, October 11, 1939.

The first authentic cesarean performed in the United States was done by Dr. Jesse Bennett^s on his wife in 1794. He removed both of her ovaries at the same time. The first recorded operation was performed by Dr. Richmond in Newton,⁵⁷ Ohio, April 23, 1828. The operation was performed in a house with unchinked crevices, without chimney or floor. His only assistants were two women, whose sole duty was to hold blankets to prevent the wind from blowing out the candles. The operation was performed with those few instruments found in a physician's common pocket case. The patient made a rapid recovery and was able to do light housework twenty-four days after the operation.

The first operation of removing the uterus after a cesarean operation was performed in Boston on July 21, 1869, by Professor Horatio Storer.⁶⁹

According to DeLee,¹⁵ Oslander of Goettingen was the first to perform a definitely planned low cervical cesarean section. The latter reasoned that by incising the lower uterine segment, there would be less hemorrhage, that the intestines would not protrude into the wound, and that drainage of the lochia would be directly into the vagina. His first operation was performed in 1805 and his second in 1806. Although both his patients died, he was very proud of his operation and kept one of the bodies to demonstrate the feasibility of the operation to his students. Joerg,³⁷ in 1806, recommended that the uterus be emptied, suprapubically, by approaching the lower segment of the uterus or the upper portion of the vagina from the side. In 1820, Ritgen⁵⁹ attempted to reach the lower segment of the uterus through an incision slightly above and parallel to Poupart's ligament (right), extending from the pubic tubercle to the anterior superior spine of the ilium. The loosely fitting peritoneum was pushed upward until the vagino-uterine junction was reached; this was cut through and delivery was made through the opening. Profuse hemorrhage rewarded his efforts. Baudelocque³ of Neffe in 1823 carried out two similar operations. One of his patients died of hemorrhage and the other peritonitis. In 1870, Theodore G. Thomas⁷¹ and Skene operated according to Joerg's suggested technic in five cases. Three mothers and four children survived. Dr. Thomas²⁶ performed his first operation of laparo-elytrotomy, or gastro-elytrotomy in February, 1870, on a young Irish

multipara who had died of uremic convulsions eight hours previously. Within a month from the time of this experimental operation he describes his second operation upon a living woman but dying of pneumonia, as follows:

"The patient being placed upon a table, anesthesia was produced to the point of quieting her restlessness and jactitation, with a few inhalations of ether. I then passed my hand up the vagina and dilated the cervix slowly and cautiously, so that at a three-quarter distention no injury was done to its tissue. With a bistoury I then cut through the abdominal muscles, the incision being carried from the spine of the pubis to the anterior superior spinous process of the ilium. The lips of the wound were then separated, and by two fingers the peritoneum was lifted with great readiness, so that the vagino-uterine junction was reached. The vagina was then lifted by a steel sound passed within it, and cut, and the opening thus made was enlarged by the fingers. The cervix was then lifted into the right iliac fossa by the blunt hook, while the fundus was depressed in an opposite direction. I then passed my right hand into the iliac fossa and introduced two fingers into the uterus, while the left hand, placed on the outer surface of the uterus, depressed the pelvic extremity of the fetal ovoid. The knee was readily seized, and delivery easily and rapidly accomplished. The child was born alive, but was a badly developed harelippped and, as I before stated, premature infant. It lived for an hour or two, during which time the rite of baptism was administered to it. The mother, the wound in whose abdomen was closed by interrupted suture, died about the same time as the child."

Thomas³¹ operated twice; Skene four times; Charles Jewett of Brooklyn twice; Hime, Edis, Dandridge and Taylor of Cincinnati, and Walter R. Gillette of New York, each once; in all, twelve. Women saved, six; children living but not moribund, seven; bladder lacerated in six cases. In properly calculating the risks of the operation it is fair to exclude the moribund case of Thomas, the intemperate and bedridden one of Hime, and the diseased subject of Edis, who survived, respectively, one hour, two hours, and forty hours. The balance, nine cases, were favorable in four instances and unfavorable in five; six of the nine women recovered, and five children were saved.

Solms⁶⁶ and Dührssen,²¹ to circumvent manual dilatation of the cervix, combined vaginal hysterotomy with the flank incision of Ritgen. Dührssen designated it as the "Buddha Geburt" or laparo-colpohysterotomy. This operation has gained no recognition.

Davis,¹⁴ in 1924, reported twenty-eight cases

done by a modified gastro-elytrotomy technic with two deaths. He made no attempt to open the vagina. (Although at times it was opened where more room was needed.) The bladder was pushed off the lower uterine segment downward and to the left. The denuded area was incised vertically and the child delivered by internal podalic version. He encountered much bleeding in the abdominal wall, and in several of the early cases the uterine wound tore across the right uterine artery. The operation is time-consuming (fifty minutes to two hours), and presents too many technical difficulties which can be easily avoided by a midline incision.

In 1876 Porro⁵³ introduced and recommended the supravaginal removal of the uterus with fixation of the cervical stump extraperitoneally into the abdominal wall. This operation was certainly a life-saving measure in infected cases and would have been employed with increasing frequency but for the introduction by Säger⁶² of his rehabilitated classical cesarean in 1882. Säger's operation enforced rigid asepsis and firm suture of the walls of the uterus, special attention being paid to exact union of the uterine peritoneum as an added barrier to the later leakage of the lochia. Although Kehrer,³⁸ employing a transverse incision of the uterus and suggesting the same improvements in technic as Säger, antedated him by one year, he is rarely given any credit for an excellent piece of work. Kehrer may be called the father of transverse incision of the uterus.

With the employment of Säger's technic the mortality following cesarean section fell rather rapidly from 65 to 5 per cent and lower. Previous to this the uterus had been dropped back into the peritoneal cavity, poorly sutured or at times not sutured at all, dooming the patient to succumb from immediate hemorrhage, or later, to peritonitis.

Although the Säger operation was a great advance in the right direction because of its simplicity, its control of hemorrhage and intraperitoneal leakage, the maternal mortality was very little reduced in the potentially infected or neglected cases. These poor results induced Fritz Frank,²⁴ in 1906, to introduce his suprasymphiseal delivery. He made a transverse incision (Bardenheuer) immediately above the symphysis pubis through the entire thickness of the abdominal wall, and sutured the visceral peritoneum of the

uterus to the parietal peritoneum. The child was delivered through a transverse incision in the uterus. He carried out thirteen such operations with no maternal mortality. Physick⁵⁰ of Philadelphia, in 1822, had recommended a similar operation but had never used it on any subject. Physick thought that the peritoneum could be pushed off the bladder and the anterior wall of the uterus, thus giving space for the delivery of the child without invasion of the peritoneal cavity. Frank found this possible only in part of his cases. Frank's work stimulated Sellheim to extensive anatomic studies of the pelvic viscera in both the pregnant and non-pregnant woman. Sellheim⁶⁵ discovered that the peritoneum was very firmly attached to the bladder at its summit and that this attachment was less firm the farther from the center of the bladder one went laterally. In doing the low cervical operation, Sellheim found it very difficult to go over the top of the bladder sub-peritoneally. He adopted a second plan which was similar to Frank's method of splitting both the parietal and visceral peritoneum transversely, suturing them together with a continuous catgut suture before delivering the child by a transverse incision in the uterus. Sellheim developed a third operation in frankly infected cases which he designated as the utero-abdominal fistula operation. He sutured both the parietal and visceral peritoneum to the skin of the abdominal incision, and after delivery of the child brought the gaping ring of the cervix up and sutured it to the sides of the abdominal incision. In 1910, Sellheim, by further experimenting with the low cesarean, simplified the operation by opening the abdomen longitudinally instead of by a Pfannenstiel incision. Instead of suturing the parietal to the visceral peritoneum, he trusted to laparotomy pads to take care of the peritoneal spill. He incised the vesico-uterine plica transversely, dissected the upper flap up and the lower flap consisting of the bladder downward, made a longitudinal incision in the cervix and delivered the child. This fourth (intraperitoneal) operation of Sellheim is the basis for the low cervical or laparotrachelotomy of DeLee, Franz, Opitz, Krönig, and Beck.

Veit⁷⁷ and Fromme,²⁵ in 1908, developed the transperitoneal extraperitoneal operation. At first they used Frank's method but before uniting the peritoneum they took out the original sutures which joined the parietal to the visceral perito-

neum and closed the peritoneum in accordance with its original anatomical relationship. They later changed the operation by making the incision longitudinal in both the abdominal wall and in the uterus. Clamps instead of sutures were used to unite the uterine to the parietal peritoneum. Hirst³² of Philadelphia, in 1913, independently invented a similar operation. The sutured four layers of peritoneum were brought together in the midline under the fascia of the anterior abdominal wall. Hofmeier,³⁴ in 1908, introduced a similar operation, differing from the above only in that he recommended drainage of the wound.

There were a certain number of operators, however, who were fearful of the infection of the peritoneum by the uterine spill. Sellheim probably was the greatest experimenter along the extraperitoneal lines. Küstner,⁴¹ Latzko⁴³ and Döderlein²⁰ almost simultaneously and independently of one another worked out three ingenious approaches to the lower uterine segment, all of them utilizing the space beneath the bladder, or, perhaps, we had better say the space beneath half the bladder, as the site of the incision in the lower uterine segment through which the child could be extracted.

Newell⁴⁶ favors Küstner's technic. The latter reports 112 cases with only two maternal deaths. He claims that one-half of the cases were potentially infected and unsuited for the classical operation. Newell's description of the operation is as follows:

"The patient (who should be well advanced in labor) is etherized and the abdomen prepared. She is then placed on the operating table in the Trendelenburg position. Unless the bladder is distended with urine, 150 cubic centimeters of sterile salt solution or boric acid are introduced into the bladder. A vertical incision is made just outside the outer border of the left rectus muscle, extending 12 centimeters upward from Poupart's ligament. The deep layer of fascia is incised with care, the object being to expose, but not open the peritoneum. The reflexion of the peritoneum from the abdominal wall to the viscera and the left side of the bladder is now visible. By means of scissors and gauze dissection the left side of the bladder is dissected off from the anterior surface of the lower uterine segment and drawn well beyond the midline by a retractor. The peritoneal reflexion is pushed upward as far as possible and the anterior surface of the lower uterine segment is exposed by retractors. An incision is made in the midline and the child is extracted by forceps. The incision in the lower uterine segment must be very care-

fully made, owing to the extreme thinness of this portion of the uterus, it being never more than a few millimeters thick, as any carelessness may result in cutting the child. The placenta is now removed, the uterine wound is closed in two layers by catgut sutures, and the abdominal wall is closed in layers, except at the lower angle of the incision, a small gauze drain being inserted into the deepest part of the wound.

"The amount of hemorrhage is usually not excessive and is easily controlled. There is always some danger of injuring the bladder and of opening the peritoneal cavity, but if the dissection is made with care neither of these accidents should occur. During the separation of the bladder the left ureter and uterine artery are visible in most cases, and, therefore, should be safe from injury, but carelessness may result disastrously. The employment of the Trendelenburg position during the operation is almost imperative. The operation can be performed in the ordinary dorsal position, but the difficulties are so much increased that neither the operator nor the patient has a fair chance."

Rothrock⁶¹ was an enthusiastic advocate of the extraperitoneal operation and had this to say about it:

"The extraperitoneal operation because of its more difficult technic has never become popular. Yet after one has performed it a number of times and has become acquainted with the anatomy and the details of technic it is comparatively simple and easy.

"The technic employed in the present group, while it departs slightly from the usual routine of the extraperitoneal operation as described by most writers, differs only in a few of the details. The following is a description of the technic employed.

"With the head of the table slightly lowered, a median incision is made in the lower part of the abdomen, beginning 5 or 6 inches above and carried down toward the pubes. The incision is made through the fascia down to, but not through, the peritoneum. The peritoneum is then separated from the abdominal wall to the left of the incision until the left border of the bladder comes into view. After a little experience the border of the bladder can easily be recognized. Many recommend partially filling the bladder with a solution of boric acid before beginning the operation, in order to render its outline more easily recognizable, but I have not found it advantageous, and in some instances it has proved a positive disadvantage, because if the wall of the bladder is thin it renders it more liable to injury. Furthermore, if the bladder is partially filled it takes up more room and is less easily retracted to one side. For this reason I always make it a practice to be sure that the bladder is empty. The separation of the peritoneum from the anterior abdominal wall, owing to its loose attachment, is easily accomplished by peeling it off with a piece of gauze, meanwhile care being taken to avoid injury to the large veins which come into view at the left border of the bladder. The bladder having been located, owing to the loosening of its attachment to the

uterus under the influence of pregnancy, with a piece of gauze it may be easily separated from the uterus and displaced upwards and to the right. This blunt dissection is continued until the median line is approached. The bladder is detached from the uterus well down toward the cervix and upward toward the vesico-uterine plica, until an area of the distended cervical portion of the uterus sufficiently large to permit of an incision adequate for delivery has been uncovered. Great care should be exercised as the vesico-uterine plica is approached to avoid tearing through the peritoneum, which is often quite thin, and should this happen the rent should be immediately closed with a fine catgut suture to prevent contamination of the peritoneal cavity. With the bladder well retracted upward and to the right, the preparation is then complete for uterine incision.

"Instead of a diagonal incision extending upward and outward, as is usually recommended, delivery is accomplished through a median incision. The advantages of the median incision are less hemorrhage and less liability of tearing through the vesico-uterine plica during delivery. In a few instances this will happen even with the median incision, but if the rent is discovered and immediately closed there will be no leakage into the peritoneal cavity. With increasing experience the occasional unavoidable tearing through the peritoneum will happen less frequently. With the cervical portion of the uterus laid bare, an incision of sufficient length to permit easy delivery is made in the median line over the presenting head. The amount of bleeding varies greatly; in some the venous sinuses of the uterine wall are enormously distended, while in others the incision leaves an almost bloodless field. For the control of hemorrhage in the uterine wound, which is sometimes profuse, specially adapted triangular clamps are lightly applied over bleeding sinuses, as in all other types of operation. With the aid of the suction apparatus the field of operation may be kept fairly clear of fluids and blood until after delivery, when hemorrhage usually ceases spontaneously. . . .

"Before proceeding to deliver, it has long been my practice to first rotate the occiput anteriorly, regardless of the position in which it may be found, and to hold it in position with the left hand while the blade of the forceps is slipped under it, which will hold it in position until the other blade is applied. This secures the most favorable position for delivery and, besides, the blades of the forceps, on account of their shape, fit better when applied to the sides of the head and are much less likely to cause injury. . . . The application is made exactly as in vaginal application, with the pelvic curve directed upward.

"It is very desirable to make the uterine incision of sufficient length, otherwise considerable resistance to delivery may result, as well as irregular lacerations which may even extend upward through the vesico-uterine plica. Such lacerations are to be avoided, if possible, as accurate coaptation of the wound is more difficult, and imperfect union may result. . . .

"After delivery has been accomplished here, as in all

sections, I have adopted a conservative plan for the management of the third stage. Immediately following delivery pituitrin and ergot are given hypodermically. As the placenta is still attached, one may now safely wait until the uterus regains its tone. It is my custom to wait, if necessary, for ten to fifteen minutes, and it frequently happens that the uterine contractions will detach and even sometimes expel the placenta. In case this does not happen, a little gentle massage over the fundus will stimulate the uterus to contraction, frequently with the desired result. In case of failure of the uterus to detach and expel the placenta it is sometimes necessary to separate and deliver it manually, but this is always postponed until the uterus has regained its tone and is well contracted. Here, as in the classical section, if the cervix is uneffaced and undilated, it is then slightly dilated with a uterine dilator from above. . . .

"The placenta having been delivered, the edges of the uterine wound are grasped with volsella forceps at both ends of the incision in order to facilitate the placing of the sutures. The incision is closed by three layers of sutures, the first a continuous suture of fine catgut to approximate the endometrial edges, care being taken to avoid the endometrium. The second layer of interrupted sutures of chromicized catgut, which include the greater part of the thickness of the uterine wall, are then placed. Care is exercised in tying these sutures to avoid excessive tension and strangulation of the tissues; only sufficient tension to approximate the edges should be used. Another continuous suture of fine catgut to neatly approximate the outer edges of the wound completes the closure of the uterine incision. If there is still oozing, perfect hemostasis is secured by ligating all bleeding vessels. The uterovesical fold is carefully examined for possible rents and the bladder is restored to its normal position and its left border attached by a couple of catgut sutures to hold it in place. While the wound is large, if hemostasis is complete, drainage is unnecessary. . . .

"The advantages of the operation are safety and freedom from pain and discomfort following the operation. This feature must be witnessed to be appreciated. Quite frequently patients suffer no more discomfort following delivery by this operation than after a normal delivery, and are able to take nourishment immediately after the effects of the anesthetic have passed. It is moreover free from postoperative complications, especially meteorism and ileus. The operation does not prevent subsequent deliveries by the same operation. In a number of cases a second or even a third operation has been made in the same field without difficulty and no abnormal adhesions have been encountered following previous operations. . . .

"From time to time discussion has arisen over the question as to whether the operation is easier after labor has progressed and the head has engaged, and the statement has been made that early in labor or before the onset of labor the operation is more difficult, because at this time the lower uterine segment is not distended. According to my experience, there is little

difference and, if any, it is in favor of the early operation before the head has engaged and has become impacted. . . .

"Forty-four cases were delivered by the extraperitoneal operation and as familiarity with the technic increased the scope of application of the operation extended, until the latter part of the period it came to be the operation of choice. Of the forty-four cases, nineteen were elective and in twenty-five it was performed after labor had been in progress for some time, as, for example, in nineteen after the test of labor in doubtful borderline cases, in two after the induction of labor with the bag, and in four after an attempt had been made to deliver with instruments. In two of the latter, labor had been induced by the bag.

"There were no maternal deaths and only one still-birth. . . ."

The above description follows very closely the technic ascribed to Latzko, which the latter reported rather meagerly in the *Wiener Klinische Wochenschrift* of April 8, 1909.

After a careful study of the different extraperitoneal operations, Jellinghaus⁶⁸ selected the Latzko technic for use in the New York Lying-In and the Nursery and Child's Hospitals. Since 1923 he has acted as instructor to most of the men using this operation in these hospitals. In 1930, Steele⁶⁸ reported a study of fifty-nine cases done by the Latzko method from the Lying-In Hospital, with five maternal deaths, a mortality of 8.5 per cent. The average number of hours in labor was twenty-eight and one-half, the average number of hours after the rupture of the membranes was twenty-one and one-half.

Burns⁹ reported a series of nine Latzko operations at the New York Nursery and Child's Hospital with no maternal deaths.

In 1937, Aldridge¹ reported an interesting modification of the Latzko operation. He describes this modification as follows:

"A study of the anatomic structures around the bladder shows that its musculature is completely surrounded by a thin but definite layer of endopelvic fascia. After incising the abdominal wall, the first step in dissection is to open the layer of endopelvic fascia, covering the anterior surface of the distended bladder by a longitudinal incision in the midline. After this layer has been incised, the bladder can easily be displaced from within its endopelvic fascial capsule on the left side by blunt dissection. As soon as the anterior surface of the lower uterine segment is reached, the layer of endopelvic fascia on the posterior surface of the bladder can readily be seen as a smooth glistening layer. It has been found that this layer can be immediately opened and dissection can more readily be

continued behind the layer rather than making further attempt to free the bladder from its fascial capsule. When dissection is continued between this layer and a similar layer covering the musculature of the lower uterine segment, it will be found that a free, practically bloodless, space has been entered and that the anterior surface of the lower uterine segment can readily be exposed. Between these fascial planes the dissection can easily be carried beyond the upper border of the bladder. This is exactly the same almost bloodless space which is entered in displacing the bladder downward in doing the so-called "low flap" cesarean section by the abdominal route."

When the space bared seemed to be too limited to permit delivery without tearing the uterovesical fold of peritoneum, the latter was incised and the freed peritoneal margins were carefully sutured together. The uterus was then opened by a median incision. In addition to drainage of the abdominal incision, a small cigaret drain was placed between the bladder and the lower uterine segment. The drain passed into the vagina from the lower angle of the cervical wound.

Sellheim,⁶⁵ following his excellent anatomical studies of the extraperitoneal approach to the lower uterine segment, admonished one to keep close to the midline. He stated, "Je weiter man nach aussen geht, um so ungünstiger werden die Verhältnisse." DeLee,¹⁵ in discussing the extraperitoneal cesarean, says: "It has been learned by bitter experience that the further one advances from the midline the greater grow the dangers of hemorrhage and the more technically difficult each step of the operation becomes."

With this idea of keeping in the "midline" paramount, the writer for some years has used the following technic in reaching the lower uterine segment extraperitoneally:

The patient is placed in a moderate Trendelenburg position. About 100 c.c. of sterile boric acid solution are injected into the bladder through a large rubber catheter which is clamped off and left in situ. A midline incision is made from about 5 centimeters below the umbilicus to the symphysis. This incision extends downward to but not through the fascia except at its lower angle. Immediately above the symphysis the fascia is incised longitudinally for a distance of 5 centimeters. One thus enters the space of Retzius, which anatomically extends from the front of the bladder to the umbilicus, limited laterally below by the hypogastric and above by the inferior epigastric arteries.

Keeping this anatomical fact in mind, the parietal peritoneum is freed from the overlying abdominal fascia, from the space of Retzius upward for two-thirds of the distance to the umbilicus and laterally almost to the outer borders of the recti muscles. The fascial incision is now completed, extending upward to within one-half centimeter of the superior border of the freed peritoneum. This freeing of the abdominal parietal peritoneum allows the bladder to be pulled downward slightly. Under gentle traction the prevesical fascia is incised transversely near the bladder summit. The bladder is easily "shelled out" of its endopelvic (prevesical) fascial envelope and is pushed directly downward in the midline. To provide more room and to lessen the liability of injury to the bladder, the previously injected boric acid solution is now allowed to escape from the inlying catheter. The endopelvic layer of fascia lying behind the bladder (and in front of the lower uterine segment) is now incised transversely for a distance of 4 to 6 centimeters. The lower fascial flap containing the bladder is pushed downward and the upper flap upward. Great care must be exercised in manipulating the upper flap. Separation is much easier if the patient has been in labor several hours. A median incision 9-10 centimeters in length is made in the bared area of the lower uterine segment and the head is extracted slowly and gently with obstetrical forceps. After spontaneous expulsion or manual removal of the placenta, the uterine incision is closed with three layers of continuous chromic catgut sutures. The bladder is allowed to drop back over this suture line. The transverse incisions in the endopelvic fascia are closed by a few appropriately placed interrupted plain catgut sutures. Sterile boric acid solution is again injected into the bladder through the catheter to demonstrate any rents, which, if found, are immediately repaired. The abdomen is closed in layers with a cigaret drain placed in the lower angle of the wound. It is recommended that the operator stand on the right side of the patient, which position facilitates both the dissection of the peritoneum off the abdominal wall from below and the application of obstetrical forceps.

Aside from technical difficulties, which to some men seem to be insurmountable, the main objection to the different extraperitoneal operations lies in the frequency of injuries to bladder and

ureters. For that reason a certain number of men prefer the transperitoneal-extraperitoneal operation of Fromme²⁵-Veit,⁷⁷ or Hirst,³² as previously described in this paper.

The Gottschalk⁴²-Portes⁵⁴ operation with very little stretch of the imagination may be classified as an extraperitoneal operation. It is a cesarean section followed by a temporary exteriorization of the uterus. It is a two-stage procedure. The first stage consists in delivery of the pregnant uterus through a long abdominal incision. The abdominal wall is sutured around the uterus at the level of the cervix. A high incision is made in the fundus, as in the regular classical cesarean. The child, placenta and membranes are extracted. The incision is sutured in layers. The uterus is covered with moist packs and allowed to remain on the abdomen.

In the second stage, if the patient demonstrates uncontrollable sepsis, the uterus is amputated extra-abdominally by the Porro technic as soon as her condition warrants; however, if the patient is not too septic, the uterus is allowed to involute outside the abdomen and in twenty to thirty days, the adhesions are freed and it is returned to the peritoneal cavity.

DeLee¹⁶ suggests that the uterine wound be left unsutured, insuring better drainage. The objection to the operation is the prolonged hospitalization.

Gottschalk⁴² of Berlin described this operation in 1909 and 1911. Portes⁵⁴ of Paris, in ignorance of Gottschalk's work, reported his operation in 1924. A. Couvelaire,¹³ in 1925, reported thirty-two cases in which the Portes operation was used, with two deaths, or a mortality of 6.5 per cent. Phaneuf⁴⁸ reported a Portes cesarean with recovery in 1927. DeLee,¹⁶ in the 1938 edition of his textbook, states that up to 1935, 220 cases of the above operation had been reported, with a mortality of about 20 per cent.

As stated previously in this paper, the two-flap low cervical operation of DeLee^{17,18} or of Beck^{4,5,6} is a modification of Sellheim's number four low cervical operation. Many men think that this operation is technically much more difficult than the classical operation, and that it is too time consuming.

Falls²² in an analysis of fifty-seven cases of low cervical as compared with fifty-seven cases of the classical operation, done by himself, under

as nearly as possible similar operating room conditions, reached the following conclusions:

"1. As regards morbidity and mortality in the series, there appears to be a slight difference in favor of the low cervical operation.

2. As regards postoperative vomiting, ileus and temperature days, hospital days and wound infection, there appears also to be a corresponding slight difference.

3. There seems to be no difference in the postoperative discomfort.

4. There seemed to be less bladder dysfunction after the low cervical than after the classical operation.

5. There is no appreciable difference in the technical difficulty as measured by the operating time.

6. The results obtained by the low cervical operation are hardly so superior to those following the classical operation as to justify the extravagant praise of some of its sponsors."

When, from the desperate condition of the patient, speed in operating is imperative, Krönig's⁴⁰ low cervical operation is recommended. A transverse incision is made in the loose visceral uterine peritoneum about one centimeter above the vesico-uterine fold. The bladder is easily pushed off the lower uterine segment by blunt dissection. The bared area of the latter is incised longitudinally, the child is extracted by forceps and following spontaneous expulsion or manual removal of the placenta the uterine wound is sutured by continuous or interrupted chromic catgut sutures. The bladder is sutured over the uterine wound. Krönig⁴⁰ considered the peritonealization of the classical cesarean wound inadequate protection against leakage of septic material from the infected interior of the uterus or the uterine wound into the general peritoneal cavity, and thought that the overlying bladder would prevent this.

Beck⁶ claims his double flap operation is a modification of the Krönig operation. DeLee¹⁵ considers his and Beck's low cervical operations modifications of the Sellheim number four operation. Their operations are quite similar. They both incise the loose uterine peritoneum transversely half way between the bladder reflection and the gray seam (plica). They dissect up two flaps of peritoneum, an upper and a lower. The upper flap is made by gently passing a pair of blunt scissors, or fingers, under the peritoneum. The lower flap is formed by stripping the bladder off the anterior surface of the uterus by blunt dissection as in abdominal hysterectomy. The denuded area is incised longitudinally and the child is extracted with forceps. After re-

moval of the placenta, the uterine incision is closed by two or three layers of continuous or interrupted catgut sutures. The upper peritoneal flap is brought down and sutured over the superior portion of the closed uterine incision. The lower flap, containing the bladder, is pulled up and sutured to the uterine peritoneum about one centimeter above the original incision. Beck⁷ has modified his first operation by leaving an island of undenuded peritoneum about one centimeter wide between the two flaps to which they are sutured, with only slight overlapping.

Beck^{4,5,6} and DeLee¹⁷ are strong advocates of the above operation. DeLee¹⁷ in 1925, reported 390 cases by his technic with three maternal deaths, a mortality rate of 0.76 per cent. Greenhill²⁷ in 1929 reported 731 low cervical cesareans performed at the Chicago Lying-In Hospital, with nine deaths, or a mortality rate of 1.2 per cent.

Beck,⁷ in 1929, Montgomery⁴⁵ in 1936, and Quigley⁵⁵ in 1937, have analyzed in the accompanying tables the mortality rates of the classical as compared to the low cervical cesarean.

Phaneuf,⁴⁹ in 1936, reported 515 personally observed cases of the lower cervical operations (in 292 the transverse uterine incision, of which he is a strong advocate, was used) with an uncorrected mortality of 4.2 per cent. Many of the cases had been given a test of labor of six or more hours.

Phaneuf⁴⁹ is a vigorous proponent of the transverse uterine incision. The objections to the above incision are: (1) there is more bleeding; (2) there is danger of the incision tearing across the uterine artery or the ureter; (3) the upper incised portion of the uterine wound retracts and thickens, while the lower portion remains thin, which renders accurate suture difficult; (4) and if pus collects back of the peritoneal flaps under the bladder, the incision is too high to be readily reached and drained through the cervical canal.

Beck⁵ thinks that in the infected classical cesarean cases, general peritonitis develops because of a massive spill of infectious material into the peritoneal cavity from the interior of the uterus through a broken down uterine incision. He considers the double flap operation a barrier against this occurrence, and if pus forms under the flaps, it will drain through the cervical wound into the vagina. DeLee¹⁷ is of a like opinion.

CESAREAN SECTION—BARRY

CESAREAN SECTION AFTER SIX HOURS OF LABOR IN THIRTY-FOUR BROOKLYN HOSPITALS (BECK)

Hours in Labor	Classic Operation				Low Operation			
	No Vaginal Examinations		Vaginal Examinations		No Vaginal Examinations		Vaginal Examinations	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
6-12	89	5	48	4	13	0	7	0
12-18	50	2	29	4	11	0	3	0
18-24	50	2	45	5	11	0	11	0
24-30	34	2	11	0	4	0	6	2
30-36	18	1	20	2	7	0	6	1
36-42	8	0	6	1	2	0	4	1
42-48	14	1	13	0	8	0	8	1
Over 2 days.....	10	3	27	11	10	1	12	1
Total cases	472 with 43 deaths; 12.3%				123 with 7 deaths; 5.6%			

Other factors may explain the better results of the low cesarean. Hofbauer,³³ in a histological study of forty-three uteri removed at different times during pregnancy and labor, concludes: "During pregnancy a phagocytic tissue, consisting of monocytes and clasmatocytes, makes its appearance in the base of the broad ligament, and is intensified by the stress of prolonged labor, but particularly by the existence of infection. . . . The presence of this phagocytic tissue in the parametrium must be regarded as a prophylactic biological reaction and as a marked protection against infection."

Schilling⁶⁴ states:

"It is a well established fact that tissues exposed more or less constantly to infection will develop and exhibit a corresponding degree of resistance to microbic invasion. And, it is well known, too, that in parts of the body well protected from every form of contamination, such as the mediastinum, for instance, the tissues exhibit a comparatively low degree of immunity against infection.

"So the tissues of vagina and cervix accustomed to battling infection have developed a substantial degree of resistance to bacterial invasion.

"This circumstance will explain why lacerations of the cervix and abrasions in the vagina so comparatively seldom result in dangerous infection. On the other hand, the cavity of the uterus is normally sterile. Consequently, its resistance to infection is comparatively low. So that in this location bacteria may exhibit great virulence, which in the lower birth canal are quite innocuous."

The smaller operative blood loss in the low cervical as compared to the classical cesarean, may contribute in no small degree to the smoother convalescence of the patient. This is particu-

EFFECT OF ABDOMINAL CESAREAN SECTION THE PUERPERAL MORBIDITY AND MATERNAL MORTALITY OF CESAREAN SECTION IN DISPROPORTION CASES (MONTGOMERY)

1. Classical elective cesarean section.	
Maternal mortality	1 in 110 = 1.9%
Puerperal morbidity	51 in 110 = 46.0%
2. Classical cesarean section, section after less than 12 hours of labor.	
Maternal mortality	0 in 15 = 0.0%
Puerperal morbidity	8 in 15 = 53.0%
3. Classical cesarean section, section after more than 12 hours of labor.	
Maternal mortality	3 in 38 = 8.0%
Puerperal morbidity	24 in 38 = 63.0%
4. Low cesarean section	
Maternal mortality	1 in 28 = 3.5%
Puerperal morbidity	18 in 28 = 64.0%
Total mortality rate for cesarean section in disproportion	5 in 191 = 2.6%

QUIGLEY'S COLLECTION OF 11,994 CASES

	Cases	Deaths	Rate
Classical Cesarean.....	5,757	325	5.6
Low Cervical.....	3,700	66	1.78
White House Conference 138 Hospitals.....	2,273	134	5.9
Rochester General Hospital (Low cervical).....	264	1	0.3
	11,994	526	4.38%

larly evident in those patients who have been in labor several hours. The lower uterine segment is markedly thinned out and bleeds but scantily when sectioned. It is almost a truism that the thinner the cervical zone the less the bleeding.

Greenhill²⁷ and others claim that the presence of the wound in non-contracting or quiet zone of

the uterus lessens the tendency to postpartum hemorrhage and favors better healing, thus minimizing the danger of rupture in subsequent pregnancies.

In any consideration of the various types of cesarean section, it must be clearly realized that the time element is by far the most important factor in controlling the mortality rate. No matter how skillful or experienced the operator, no type of operation devised by the ingenuity of man will save the prospective mother from a septic death, if it is done at an unfavorable time.

The maternal mortality is lowest where the operation is carried out before the onset of labor. Even at this favorable time the basic mortality varies from 0 to 2 per cent, and the danger of the operation increases progressively with the advance of labor. Holland^{35,36} gives the following illustrative findings in 1,953 sections for contracted pelves:

Time of operation	Number of cases	Mortality per cent
A. Before labor	1202	1.6
B. Early in labor	389	1.8
C. Late in labor	220	10.0
D. After induction of labor	35	14.0
E. After attempt at delivery by forceps or craniotomy	107	27.0
Total	1953	4.3

Stander⁶⁷ considers the classical cesarean unsafe after labor has been under way for more than six hours. Peckham's⁴⁷ analysis shows a rapid rise in morbidity and maternal mortality after twelve hours of labor.

Histological and bacteriological investigations, as well as clinical experience, prove that the uterus is frequently infected after a prolonged labor. The factors which influence bacterial invasion of the uterus during labor are: (1) vaginal examinations; (2) time of rupture of the membranes; (3) duration of labor; and (4) intra-uterine manipulations.

Harris and Brown³⁰ in a study of fifty cases during labor found positive cultures in twenty-two, thirteen of which had not been examined vaginally; also of the twenty-two patients with positive cultures, seven were infected despite unruptured membranes.

In twenty-nine patients who had been in la-

bor less than six hours when cesarean was done, cultures were sterile in twenty-eight; in the one showing positive culture, although not in labor, the membranes had been ruptured for ten hours. In fourteen of twenty-two infected cases the temperature was normal; the remaining eight patients show elevations of temperature, but two of these were less than 100 degrees F.

From this investigation, Harris and Brown³⁰ concluded that the uterus was free of bacteria at the end of pregnancy and also during the first few hours of active labor, and that the probability of ascending infection increased with each hour of labor. Their investigations justified the conclusion that ascending infection is probably the most important factor in the causation of the high mortality rate following cesarean section. This ascending infection occurred in the presence of unruptured membranes, and the absence of temperature was no certain criterion that the patient was not infected.

The incidence³⁹ of cesarean section in the United States averages 2.9 per cent. This is far too high an incidence, leaving us with a maternal mortality rate which startles the rest of the civilized world. To correct this high cesarean rate and indirectly reduce our mortality rate, several suggestions are ventured:

Pay closer attention to pelvic measurements. Realize that external measurements have little value unless one takes accurate internal measurements and also learns to palpate the bony pelvis. Carefully check the above with expert pelvic x-ray measurements, as suggested by Thoms⁷²⁻⁷⁶ and later by Caldwell and Moloy.^{10,11,12}

Observe the patient closely in the last month of pregnancy and determine whether the head will enter the pelvic inlet readily. Try to learn when the head is moldable or not by its consistency.

Have a clear conception of what is meant by a trial of labor or the test of delivery. Is the given pelvis too small to venture a test of labor? A trial of labor means allowing the patient to enter labor and closely watching to see if the cervix will dilate, if the head will fix itself in the inlet, and, if fixation occurs, will it engage, as evidenced by the presenting part reaching the level of the ischial spines. A real test of delivery means four to six hours of hard pains every three to six minutes after complete dilation of the cervix with the membranes ruptured.

Besides a contracted pelvis, tumors blocking the birth canal may remain unrecognized until so late in labor that a classical cesarean would be too hazardous. The situation or the size of the tumor may render any of the so-called low cervical or extraperitoneal operations impossible. A pelvic examination early in pregnancy might easily prevent the occurrence of such tragic situations.

A prolapsed cord or arm may be too badly infected for delivery through the general peritoneal cavity. However, delivery by the extraperitoneal or transperitoneal-extraperitoneal route may be comparatively safe for the mother, thus avoiding sacrifice of the child.

Too many patients are sectioned for a suspected contracted pelvis, whereas, if careful pelvic studies were made, it would be clearly realized that the pelvis was of ample size, but that a cervical dystocia was the real cause of the prolonged labor. Many patients entering the hospital for delivery are not in true labor, but are experiencing a preliminary period which may ensue before the development of actual labor. Hamilton²⁸ has shown that in 539 primiparae, 375 had a preliminary period of fifteen hours and fifty-one minutes; in 461 multiparae, 306 had a preliminary period of fifteen hours and seven minutes. It would seem ridiculous to section a woman, in the preliminary stage of labor, for dystocia.

Contracted pelvis are not common in the United States, and Dewees¹⁹ wrote in 1828 that he had met only three cases in his large experience. Reynolds,⁶⁶ in 1890, reported an incidence of 1.34 per cent of contracted pelvis in a series of 2,227 women delivered in Boston. In 1897, Flint²³ reported an incidence of 8.46 of contracted pelvis in 10,233 patients delivered at the New York Lying-In Hospital. Williams,⁷⁸ in a series of 11,630 women delivered at the Johns Hopkins Hospital, found that 3,100 of them presented a contracted pelvis of some type. In this series the incidence of contraction of the inlet was 8.96 per cent in the white, and 37.31 per cent in the negro women. Six per cent of the series showed a contraction of the outlet, *i.e.*, an intertuberous diameter of 8 centimeters or less. Reports from larger clinics showed that 69 to 81 per cent of these women will deliver spontaneously if labor is conducted properly. Stander⁶⁷ gives an incidence of spontaneous delivery of 81.75 per cent;

Valency 69 per cent; Peham 72.4 per cent; Bar 76.5 per cent; Bürger 77.8 per cent; Krönig 78.5 per cent; and Baisch 80 per cent.⁶⁷

Schauta,⁶³ in 49,397 deliveries, found 5,288 contracted pelvis, an incidence of 10.7 per cent. Of these women 77.8 per cent with contracted pelvis delivered themselves spontaneously with only four maternal deaths, or a maternal mortality of .09 per cent, which would seem to prove that the best that can happen to a woman with a contracted pelvis is to be allowed to deliver spontaneously.

Classical cesarean, at the time of election, should be reserved for those patients who, after careful study, demonstrate clearly their inability to deliver spontaneously; in the border line cases, if after a trial of labor of not much more than six hours, there is no progress, the low cervical operation of DeLee,¹⁷ Beck,⁴ or Krönig⁴⁰ is recommended; if labor has continued for twelve hours, or if the membranes have been ruptured for more than four hours, and the patient is not exhausted and presents a normal temperature and pulse, one of the various types of transperitoneal-extraperitoneal or a real extraperitoneal operation should be the operation of choice.

In contemplating any type of cesarean operation, it must be clearly realized that puerperal infection is a wound infection. One must hesitate to place a wound in the uterus and soft tissues in the presence of an existing infection, as evidenced by a high temperature, rapid pulse and foul vaginal discharge. Even a pubiotomy should not be considered (which facilitates delivery best where there is a contraction of the outlet); only a craniotomy will give the woman her greatest chances of survival. For religious reasons or because of a great desire on the part of the parents for a child, one might consent to undertake a Porro operation in the face of an existing infection. But it should be clearly explained to the patient that the mortality of the above operation averages from 1.56 (John W. Harris)²⁹ to 17.4 per cent (Eardley Holland).³⁶ Facing the same circumstances in a young woman, in order to save the uterus, one might give serious consideration to the Gottschalk-Portes operation (mortality 20 per cent, DeLee).¹⁶

In summing up the question of which type of cesarean section to employ, it must be clearly realized that the ideal operation is one that offers

the greatest safety to the patient and is technically not too difficult for the average surgeon. The low cervical operation according to the technic of Krönig,⁴⁰ Beck,⁶ or DeLee¹⁷ seems best to meet these requirements. If one fears the peritoneal spill encountered in this operation, and is technically competent, he may approach the uterus extraperitoneally; if not technically competent, it is recommended that he employ the simpler technic of the Fromme,²⁵ Veit,⁷⁷ or Hirst³² operation.

From the statistics quoted in the above paper, it appears clearly evident that the borderline case can be given a longer trial of labor with a far greater margin of safety to the patient when any of the various types of low cervical operation are employed than with the classical cesarean.

Finally, the obstetrician and surgeon must be keenly awake to the fact that it is clear thinking rather than expert operating which, in general, offers the greatest chances of recovery to the patient; an exhausted or a frankly infected subject is a poor risk for any type of operative procedure, whether it be a craniotomy, pubiotomy, a Porro cesarean or any of the various types of low cervical or extraperitoneal cesareans described in this paper.

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FURTHER RESULTS IN THE TREATMENT OF ACUTE POLIOMYELITIS WITH ANTISTREPTOCOCCIC SERUM* (1928-1937)

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IT has been conclusively demonstrated time and again that the inciting agent of acute epidemic poliomyelitis is a filtrable virus as now understood. Studies of the virus have yielded information of great value regarding the pathogenesis of this disease but these studies, it can truly be said, have yielded little of practical value for specific prevention and treatment and little information as regards the source of the virus. Convalescent serum could not solve the problem because the disease would have to continue to occur in virulent form, with its dire consequences, in order to insure a supply. Virus vaccines containing cord tissue obtained from monkeys that had succumbed to poliomyelitis could not be prepared in sufficient amount for general use.

Impressed by the early work on the streptococcus (1916) when Towne, Wheeler and I first demonstrated it in and isolated it from the nasopharynx and the lesions in the spinal cord of human beings and monkeys that had succumbed to poliomyelitis, I have continued to study this dis-

ease by special methods from the point of view of both the streptococcus and the virus in the hope that effective methods for specific prevention, diagnosis and treatment might be found. Reports of results on different phases of the problem,^{3,7,8,10,12,15} including treatment of the disease with the antistreptococcic serum,^{5,6,7,11,13,14} have been made from time to time. The results of treatment of the disease with the antistreptococcic serum have been corroborated by independent observers.^{1,2,4,16,17}

A comprehensive review of this work, together with important unpublished data, will be published elsewhere. Suffice it to state at this time that all reasonable requirements for establishing the causal relationship between the streptococcus and this disease now have been fulfilled, including the demonstration of streptococcal antigen in the serum of patients and monkeys during the acute stage of the disease and demonstration of streptococcic antibodies during convalescence, and the making of the virus from the streptococcus.⁹

Monkeys have been immunized against the vi-

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ACUTE POLIOMYELITIS—ROSENOW

TABLE I. RESULTS: TREATMENT OF ACUTE POLIOMYELITIS WITH ANTISTREPTOCOCCIC SERUM: 221 PATIENTS RECEIVING SERUM AND 116 PATIENTS NOT RECEIVING SERUM

Groups	Patients	Deaths		Patients*	Residual paralysis				
		Number	Per Cent		None	Slight	Moderate	Severe	
								Number	Per Cent
Serum given	221	10	4.5	211	161	29	14	7	3.3
Serum not given (controls)	116	23	19.8	93	34	10	17	32	34.4

*Patients out of 221 who received serum and survived and those out of 116 who did not receive serum and survived.

rus of poliomyelitis with vaccine prepared from the streptococcus. Serum obtained from horses immunized with the streptococcus has been shown to neutralize the virus and to have curative action on poliomyelitis among monkeys and human beings.^{7,11} The results of the intradermal injection of the antistreptococcic serum and the precipitation test performed with this serum, and the serum of patients, have been shown to be diagnostic of poliomyelitic infection, especially early in the prepoliomyelitic and preparalytic stages of the disease.¹⁰ It is the purpose of this paper to record additional results achieved by the use of antistreptococcic serum in the treatment of acute epidemic poliomyelitis.

This paper is composed of, first, results obtained in the treatment of patients who have received the serum since 1928 under my supervision and under the supervision of physicians to whom I sent the serum at their request; and second, effects of the disease among patients who lived under conditions comparable to those of the first group, and who had attacks of similar severity at about the same time during the same outbreaks of the disease, but who did not receive the serum. Results in the course of the disease among the two groups of patients are compared. The results observed by attending physicians were recorded and reported in the form of answers to a questionnaire sent with each lot of serum. Only cases in which information left no reasonable doubt as to the correctness of the diagnosis of acute poliomyelitis were considered.

Altogether, cases representing 337 patients were available for analysis; in 221 of these serum was administered and in 116 serum was not administered (Table I). Of the 221 patients who received serum, 137 were males and eighty-four were females. Of the 116 patients used as controls, seventy-seven were males and thirty-nine

were females. The ages in the two groups were comparable. The initial symptoms in the group in which serum was administered were somewhat more severe than the initial symptoms in the control group.

Thus, the initial symptoms for 188 patients of the group in which serum was administered were considered to be severe in seventy-nine instances (35.7 per cent), moderate in eighty-two (37.1 per cent) and mild in twenty-seven instances (12.2 per cent). The initial symptoms for ninety-three patients of the group of controls were considered to be severe in twenty-seven instances (28 per cent), moderate in forty-two (45 per cent) and mild in twenty-four (26 per cent). Since protocols of individual patients to whom treatment with serum was administered have been reported previously,⁶ they are omitted from this report.

In view of the fact that many patients were treated and reported on by physicians with limited experience in the treatment of poliomyelitis, I have summarized the results according to the two most important consequences of this disease, death and residual paralysis, in Table I. Errors in judgment as regards minor effects observed were thus almost wholly eliminated. Moreover, in order to eliminate other possible criticism, all patients who received serum were included, regardless of the amount, or the time of the administration, of the serum after the onset of symptoms and regardless of the condition of the patient.

Of 221 patients who received the serum, ten (4.5 per cent) died, whereas of the 116 control patients who did not receive serum, twenty-three (19.8 per cent) died. Of the 211 patients who had received serum and who survived, 161 recovered without having residual paralysis, twenty-nine had slight paralysis, fourteen had moderate residual paralysis and only seven (3.3 per

cent) had severe residual paralysis. In contrast, of ninety-three patients in the group of controls who survived, only thirty-four did not have residual paralysis, ten had slight paralysis, seventeen had moderate paralysis and thirty-two (34.4 per cent) had severe residual paralysis.

The serum was injected intramuscularly once or twice daily in amounts ranging from 5 to 20 c.c., depending on the age of the patient, severity of symptoms and results obtained. The serum used consisted of one part of the centrifugated euglobulin (bacterial-antibody) fraction of the antiserum of horses hyperimmunized with the heat-killed poliomyelitic streptococcus, dissolved in nine parts of physiologic salt solution rendered 0.2 per cent phenol. The euglobulin was precipitated by diluting one part of whole serum with nine parts of slightly acidulated distilled water. Only strains of streptococci freshly isolated from the nasopharynx, spinal fluid or brain and spinal cord of human beings and from the spinal fluid or brain and spinal cord of monkeys that had succumbed to poliomyelitis—that is, only strains that had “neurotropic” cataphoretic velocity and that produced flaccid paralysis in rabbits—were used for the immunization of horses. These strains were kept in a dense suspension of two parts of glycerol and one part of a solution of 25 per cent sodium chloride throughout the period of immunization. The serum was obtained from horses after the content of antibodies had become high, and usually after one to five years of weekly intravenous injections of the streptococcus.

In 188 of the 221 patients to whom serum was administered, the number of injections and the total amount of serum administered were recorded. To these patients, a total of 508 injections was administered, representing 7,670 c.c., or an average of about 15 c.c. at each injection, and 40 c.c. for each patient. The amount of serum administered per patient ranged from 10 c.c. to 200 c.c. Forty-nine patients received only one injection of 10 c.c. or more, nine received two injections which were twelve to twenty-four hours apart, thirty-one received three injections, twenty-eight received four injections, twenty-six received five injections and twenty-three received six injections or more. The incidence of immediate and late reactions to the serum was obtained in the treatment of 153 patients. Only one person had an immediate severe reaction to the

serum, three had a moderate reaction, three a slight reaction and 146 had no immediate reaction. Six patients had severe late reactions, fifteen had moderate reactions, twelve had slight reactions and 120 did not have a late reaction.

Of the ten patients who died in the group that received serum, all had marked paralysis before the serum was administered. The serum was administered to three patients on the second day of illness, to four on the third day and to three on the fourth day. In five of these patients respiratory paralysis had developed before the first dose of serum was injected. Seven patients were adults twenty to forty-eight years old, one was fifteen years old, one was twelve and one was three and a half years old. The number of cells in the spinal fluid of six patients who died ranged from 30 to 640; the average was 517 cells. Severe symptoms characterized all patients from the onset of the disease.

Of the seven patients to whom serum was administered and who recovered with severe residual paralysis (Table I), five had severe paralysis before treatment with serum was instituted and two had moderate paralysis. In only one instance was the first injection made as early as the second day after the onset of symptoms; in two, on the third day; in two, on the fourth day, and in two on the seventh day. The number of cells in the spinal fluid of four of these seven patients ranged from ten to 250 cells; the average was 139 cells. The ages of these seven patients ranged from one and a half years to twelve years and averaged four years. The average time of the first injection of serum was 4.7 days after the onset of symptoms.

Of the twenty-nine patients who had slight residual paralysis after treatment, twenty-one had a severe degree of paralysis and two did not have any paralysis at the time of the first injection of serum. The number of cells in the spinal fluid of seventeen patients ranged from thirty-one to 329; the average was 126 cells. The ages of the patients ranged from six months to forty years, and averaged ten years. The average time of the first injection of serum after onset of symptoms was 3.5 days.

Of the 161 patients who eventually recovered without residual paralysis, 106 did not have paralysis, eight had slight paralysis, six had moderate paralysis and forty-one had severe paralysis, at the time of the first injection of serum. The

ages of patients in this group ranged from six months to twenty-seven years, and averaged 8.2 years. The number of cells in the spinal fluid of 100 patients ranged from eleven to 800 cells; the average was 146 cells. The average time of the first injection of serum after the onset of symptoms was 2.3 days.

Comment and Summary

The results of treatment with poliomyelitis antistreptococcic serum of an additional series of patients suffering from poliomyelitis are reported. The severity of the disease at the onset, the ages of the patients concerned and the number of cells in the spinal fluid of the patients were about the same for the four groups of patients who received serum and who recovered with no paralysis or with varying degrees of residual paralysis.

The degree of residual paralysis that resulted was in direct proportion to the duration of the disease before the administration of the serum. Thus, among those patients who recovered with severe residual paralysis, the average duration of the disease before serum was administered was 4.3 days; among those who recovered and had moderate residual paralysis, the average duration of the disease before serum was administered was 4.7 days; among those who recovered and had slight residual paralysis the period was 3.5 days, and among those who did not have residual paralysis it was 2.3 days.

The much lower mortality (4.5 per cent) and much lower incidence of severe residual paralysis (3.3 per cent) in the group to whose members a serum had been administered in comparison with the mortality (19.8 per cent) and incidence of severe residual paralysis (34.4 per cent) in the group of controls seem directly attributable to the action of the antistreptococcic serum.

Favorable results were consistently obtained each year among the different groups of patients treated and with each of the different lots of anti-serum used. Evidence of the beneficial action of the serum was not limited to the effect on mortality and on the final outcome as regards residual paralysis. Beneficial action was noted at the bedside among nearly all patients to whom serum had been administered early, especially in the treatment of those patients who were in the pre-paralytic stage, and in many instances even after paralysis had begun to afflict some patients.

Restless, nervous children often fell asleep soon after receiving the first injection of serum. This was true alike of patients for whom spinal puncture was or was not made at the time of the injection of serum. Headache and pain in the involved extremity or part often were lessened or relieved. The temperature, especially among patients in the preparalytic stages, rapidly decreased to normal, usually after an initial transient elevation.

Progressive paralysis often was seemingly arrested. Restoration of muscular function was apparently more rapid among patients who received serum than among those who did not receive the serum. These favorable results, obtained since 1928, are in strict accord with those previously reported.^{6,7,13,14}

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RECENT PROGRESS IN OTOTOLOGY*

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PROGRESS in otology in past decades compared with other medical specialties has been embarrassingly slow, largely because of the inaccessibility of the ear and the crudeness of available methods employed in research and clinical practice.

Recently the application of electro-acoustic principles, radical improvements in surgical technic, revolutionary discoveries in chemotherapeutics and the recognition of overlooked factors which produce ear pathology have greatly increased our knowledge of the causes, prevention, treatment and alleviation of diseases of the ear.

Much of this newly acquired knowledge has been widely disseminated, sometimes in a sensational but impressive manner, by popular health talks, radio broadcasts and articles in the press. As a result, the intelligent layman not infrequently seems better informed regarding otological progress than the busy family physician. New responsibilities have thus been imposed on the medical profession in that the public today demands of the otologist and the general practitioner better service in the care of ear diseases than has been given in the past.

Therefore it seems appropriate for our better orientation to briefly indicate some of the recent advances in this field.

The development of the audiometer marked the beginning of a new era in otology. Its extensive use as an instrument for accurately measuring hearing acuity has made valuable research possible and revealed many important facts.

It early proved the inadequacy of our older methods for the detection of slight but significant hearing defects, the first requirement for solving the problem of faulty hearing.

It has disclosed a surprisingly large number of persons who have a handicapping or a potentially handicapping hearing loss, often unrecognized and neglected. The number in the United States is believed to be at least 10 million.

It has proved that among school children¹⁰ hearing deficiencies, frequently so slight as to be overlooked, cause repetition of grades, speech de-

fects, inferiority complexes and behavior problems which interfere with the development of a personality which will insure the individual's economic and social security. Recognition of this fact has resulted in recent legislation in several states making mandatory the periodic testing of the hearing of all school children by the audiometer¹¹ as the most effective means of conserving the hearing.

The chief obstacle to the more general adoption of this procedure has been the high cost of equipment. Very recently simple, reliable audiometers¹² especially designed for expeditiously and accurately testing large groups for school and industrial purposes have been released at a price so low that small communities with limited budgets can well afford to own them.

The audiometer has been found indispensable by otologists and is being rapidly adopted by general practitioners, school, public health and industrial physicians. In forensic work it has been found to be invaluable. Many physicians now use it in the periodic health examinations of their private patients.

The Council on Physical Therapy of the American Medical Association³ is rendering valuable service by formulating minimum specifications for reliable, standardized audiometers which can be sold at a moderate cost, thus safeguarding the purchaser against obtaining an inferior instrument.

Several million hearing tests with the audiometer have emphasized certain facts with which every physician should be familiar:

1. Accuracy in applying any hearing test is impossible in the presence of masking or distracting noise; and in making the test, the better hearing ear must be excluded. These simple but fundamental rules are too often ignored.

2. Handicapping hearing deficiencies appearing in adult life are very frequently the result of inflammatory processes in the ears in childhood.

3. Many individuals sustain a material hearing deficiency long before they themselves are conscious of their loss. This fact emphasizes the great importance of periodically testing the hear-

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ing at all ages by scientifically approved methods.

It is to be noted that today many more causes of hearing impairment are known than in the recent past. We mention the following:

Otologists in increasing numbers have accepted the teachings of Wittmaack,¹⁹ first published twenty years ago after extensive research. He showed that many inflammatory ear diseases and their complications have their origin in non-infectious, irritative reactions of the middle ear mucosa, caused by the entrance of non-infectious amniotic fluid and other maternal discharges. These are aspirated and forced through the tubes into the middle ear by the infant at the time of delivery. Such irritation causes abnormal development of the middle ear mucosa, whereby normal pneumatization of the mastoid is prevented and the capacity of the middle ear to resist infection is lessened.

Taylor^{16,17} has shown that the administration of quinine to expedite labor and the use of salicylates and arsenicals may cause deafness in the child. Evidence confirming Taylor's belief has been published by Mosher,⁹ who found that after the administration of quinine, salicylate of soda and mapharsen to guinea pigs, destructive hemorrhages were found in the cochlea of the fetus. Other investigators have found quinine and other drugs in the brain and cerebro-spinal fluid of infants whose mothers had been given these substances.

An important cause of hearing impairment among children has been reported recently in several papers by Crowe² and his associates. This is the presence of partially obstructing lymphoid tissue in and about the pharyngeal ends of the eustachian tubes. Its presence can be demonstrated by the nasopharyngoscope. The characteristics of this condition are early retraction of Shrapnell's membrane, hearing impairment first appearing in the upper frequencies of 4096 d.v., 8192 d.v., and higher, detectable only with the pitch range audiometer. Not until the hearing impairment has become more noticeable do the lower tones become materially reduced. This is contrary to our former teaching and is an outstanding contribution to our knowledge. Inflation proves unsatisfactory even after surgical removal of the adenoids. Brilliant results follow treatment of selected cases by irradiation with radium or the x-ray, a treatment to be safely

and effectively administered only by those especially skilled in radiology.

The above facts merit the serious consideration of all practitioners, but especially the obstetrician and the pediatrician.

From a scientific viewpoint, old age should not be considered a specific cause of severe hearing impairment. Physiologically there is a slow, gradual, measurable diminution of acuity for the higher frequencies with advancing years. This is not sufficient to produce a handicapping defect for hearing speech. Other factors have been operative during the life of the individual.

The treatment of middle ear infections and their complications caused by streptococci of the beta-hemolytic type and other susceptible organisms has been revolutionized by the use of sulfanilamide^{6,15} and related drugs. The reduction of the high mortality in cases of otitic streptococcus meningitis when this treatment is combined with adequate surgery is dramatic.

No other drug has received so much attention in medical literature. It would be idle repetition to discuss this subject further than to offer a few remarks based on recent observation and experience. Disappointment from its use may come from several causes. One is failure to observe closely the carefully prepared instructions of the manufacturers.

In acute middle ear infections early identification of the invading organism is important. When clinical symptoms point to a severe streptococcus infection, one often cannot afford to wait for the bacteriologist's report before beginning drug therapy. Failure may result from neglect to use the drug until after a complication has developed, from inadequate, uncontrolled dosage, or from its too early discontinuance.

What is most to be feared after a mastoid involvement has been clinically diagnosed is a false sense of security assumed because of a subsidence of symptoms. It is believed on competent authority that these drugs do not possess the same bacteriostatic power to overcome microorganisms when confined in collections of pus in closed or partly closed cavities such as exist in a confluent mastoiditis, an epidural abscess, brain abscess, or an abscessed lateral sinus thrombosis, as they exercise in tissues having a freely circulating blood supply.

Cases of this type are encountered in which,

after several weeks of latency, there appears abruptly a serious endocranial complication.

One can avoid such occurrences only by exercising extreme vigilance. So long as there is any purulent discharge from the middle ear, even though it be sterile, and so long as the hearing does not return to normal or nearly normal, or the tympanic membrane remains pale, lusterless and thickened, the patient should be kept under careful scrutiny and be checked at frequent intervals by roentgenographs of the mastoid, and examinations of the blood, and when indicated, of the cerebrospinal fluid. Evidence of progressive bone destruction, meningeal or labyrinthine irritation, facial paresis or a complete loss of hearing demand immediate, thorough, exploratory surgery.

There have lately been decided advances in the surgery of the temporal bone tending toward earlier and more thorough operative intervention. The term "simple mastoidectomy" is fast being supplanted by "complete mastoidectomy," more accurately to describe what should be done in the attempt to effect a cure in destructive supuration of the mastoid body. This means the thorough removal of all accessible diseased bone and the provision of adequate drainage from remote parts, as the tip, peri-labyrinthine, petrous and zygomatic cells, and exposure of the dura and lateral sinus whenever necessary to explain the symptoms.

The classic radical mastoid operation is less frequently performed than formerly, especially in cases in which the more conservative, modified radical operation, with preservation of the ossicular chain and the tympanic membrane, promises equally good surgical results and a better prospect of improving the hearing.

The endaural as distinguished from the post-auricular approach to the attic, middle ear, labyrinth and mastoid body is growing in favor among otologists, since it affords greater accessibility.

The most revolutionary advance in otologic surgery has been the long awaited, successful, one-stage fenestration operation of the bony labyrinth to improve the hearing in otosclerosis. This has lately been attained after persistent effort by Lempert.⁸ He recently reported seventy-two such operations, forty-four of which gave brilliant results in improved hearing, surpassing

the reported results of the few other operators in this field. The object of the procedure is to secure by a plastic operation a permanent fistula in the external bony semicircular canal, covered by a thin vibrating membrane obtained by transplanting a part of the drumhead. By thus again mobilizing the perilymph, the hindrance to sound perception by air conduction caused by fixation of the stapes is overcome.

The operation requires much time and great skill in plastic surgery in operating in an extremely small space. This can be acquired only by long study and highly specialized training.

It should be undertaken only on persons who still have good hearing by bone conduction, a large auricular canal and a normal tympanic membrane as established by a thorough otological examination. These requirements definitely restrict its application to relatively few of the thousands of otosclerotics who would make every sacrifice to recover useful hearing. This should be made known to those whose hopes have been raised to a high level by sensational newspaper reports regarding this operation.

Notable progress in ameliorating the condition of the aurally handicapped has resulted from recent improvements in the design and performance of electrical hearing aids. Many new features, developed in rapid succession by competing manufacturers, have confused the physician and sadly perplexed the prospective purchaser. In his helplessness against the high pressure salesmanship of certain vendors of hearing aids the patient confidently looks to his physician for help in selecting the hearing device which will best meet his requirements.

This important service can be rendered most satisfactorily after a careful otological examination, including audiometric tests for both bone and air conduction. With the information thus obtained one can specify whether a carbon type hearing aid will prove satisfactory or the patient will need one of the recently developed, compact, wearable vacuum tube types, which afford greater amplification and greater fidelity; also whether a bone conduction or an air conduction receiver is indicated.

The patient with a severe hearing loss showing great differences of acuity at various frequencies presents a difficult problem. Since different instruments possess definite but subtle differences

in their performance characteristics, capable of modification within certain limitations by selective amplification, the prospective purchaser should have the privilege of trying out the instruments of several reliable makers by the intelligibility test.^{4,5,7,14} Such comparative tests must be made under identical conditions by one who is not financially interested in the sale of any hearing aid, preferably a physician familiar with this simple procedure.

The Council on Physical Therapy of the American Medical Association,³ after thorough investigation, has pronounced the hearing devices of several manufacturers "acceptable" according to minimum standards of construction, performance and distribution set up by its Committee on Audiometers and Hearing Aids. Such accepted instruments are naturally recommended in preference to instruments of uncertain background.

The development of the wearable miniature vacuum tube type of hearing aid is a very recent accomplishment. For many whose hearing loss is extreme it often gives great satisfaction when the carbon type fails. Its advantages are the possibility of greater amplification without distortion. Its disadvantages are that it is more vulnerable and that when it suddenly fails to operate, it must be sent to the maker for repairs. The carbon type usually gives warning of impending trouble and can be reconditioned promptly by the nearby distributor. Vacuum tube aids at present have larger battery consumption than the carbon type.

The newer hearing aids have a far wider field of application than their predecessors. Persons with a moderate hearing loss who could not tolerate the adventitious noises of the old carbon transmitter available a few years ago can use a modern hearing aid with great comfort.^{1,18}

Young children whose hearing loss prevents them from acquiring normal speech, by using these devices in the home and schoolroom can acquire speech normally and can receive their education in the local schools.^{10,13}

It is a serious mistake to advise a person with a progressive hearing loss to postpone the purchase of a hearing aid as long as possible. By so doing he greatly increases his difficulties in becoming accustomed to one. Everyone who has a handicapping hearing impairment should be advised to begin early to perfect himself in the art of speech reading to further supplement his

hearing deficiency and enable him to keep his contacts in order to preserve his economic and social security. The hard of hearing person should be emphatically told that the purchase of a hearing aid is not the final solution of his hearing problem, but that he should do everything in his power, under the best medical guidance, to preserve his residual hearing by removal of all detectable causes which might produce further loss.

Conclusions

1. A better knowledge of fundamental otological facts affords a larger opportunity for the otologist, pediatricist and general practitioner to render more effective service.

2. Effective reduction of the high incidence of hearing deficiencies can be accomplished by the general adoption of the routine, periodic hearing test by scientifically approved methods, especially among school children, and continued as a part of the periodic health examination at all ages.

3. Improved hearing aids now available have a wider field of application than in the recent past. In prescribing or selecting them to best meet the specific requirements of each individual, the otologist or interested physician can render valuable help in protecting his aurally handicapped patients from obtaining an unsuitable or inferior device.

4. In selected cases, fistulization of the labyrinth in the hands of qualified operators promises the restoration of useful hearing for a large number of otosclerotics. Many who are not suitable subjects for the operation can successfully supplement their handicap by a modern hearing aid and lip-reading.

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MANAGEMENT OF POSTOPERATIVE INTESTINAL OBSTRUCTION COMPLICATED BY HEMORRHAGE ON THE BASIS OF PROTHROMBIN DEFICIENCY*

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PRESENTATION of this case is being made for three reasons: (1) the early age at which malignant change was found in a polyp of the colon, (2) the success of conservative treatment

since the patient was three months of age. The loss of blood was slight and at times there was freedom from bleeding for as long as two years. In the six months before coming to the clinic the bleeding had become more frequent and severe than formerly and the pa-

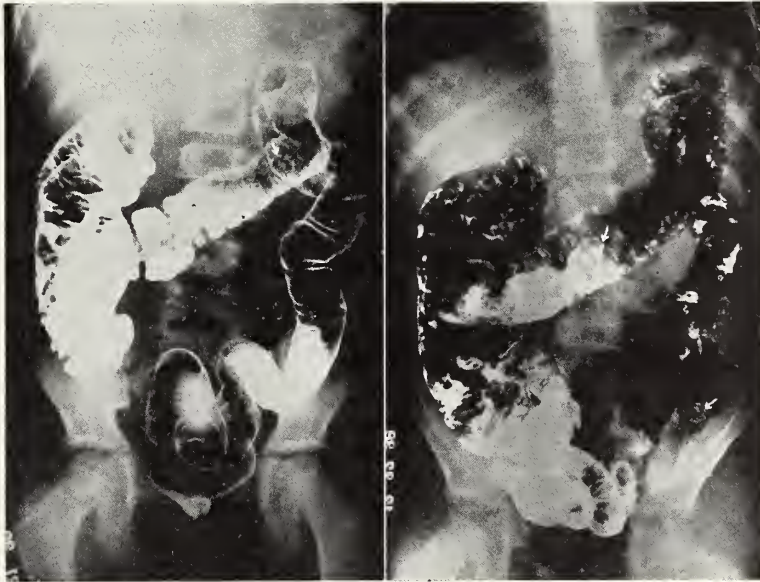


Fig. 1. Evidence of a polyp near the splenic flexure is indicated in the film on the left; evidence of a large polyp in the transverse colon and a polyp in the sigmoid is indicated in the film on the right.

of intestinal obstruction and (3) the occurrence of bleeding and a deficiency of prothrombin in prolonged intestinal obstruction.

A boy, seven years of age, of Irish parentage, was first seen at The Mayo Clinic on December 19, 1938. Rectal bleeding had been observed intermittently ever

since the patient was three months of age. The loss of blood was slight and at times there was freedom from bleeding for as long as two years. In the six months before coming to the clinic the bleeding had become more frequent and severe than formerly and the pa-

tient often passed a cupful of blood a few minutes after a normal stool. His health and development were excellent except that there was pronation of his feet. He weighed 67 pounds. There was no history of malignancy in his family. The examination revealed 14.0 gm. of hemoglobin per 100 c.c. of blood, and no abnormality of either the erythrocytes or the leukocytes was present. The findings on urinalysis were within normal limits and the results of flocculation test of the

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blood and roentgenologic investigation of the thorax were negative.

A proctoscopic examination revealed three small rectal polyps and roentgenologic investigation of the colon was advised. The roentgenologist employed the



Fig. 2. Segment of colon opened to show the polyps.

and the left ureter. A Witzel type of enterostomy was established at a site about 15 to 20 inches proximal to the cecum.

The pathologists reported that the specimen was composed of 28 cm. of transverse and descending colon. Some of the acini in a polyp 4 cm. in diameter in the transverse colon showed early carcinomatous change grade 1. The two polyps (0.5 cm. and 1 cm.) in the descending colon were adenomatous. If the gross appearance of the specimens is of any interest, this is shown in Figure 2. Figure 3 depicts the area of early carcinomatous change and also one of the adjacent adenomatous polyps for comparison. In one field in the region of malignant change, under high power, thirteen mitotic figures were counted.

This patient's immediate postoperative course was satisfactory, with the exception of a questionable re-

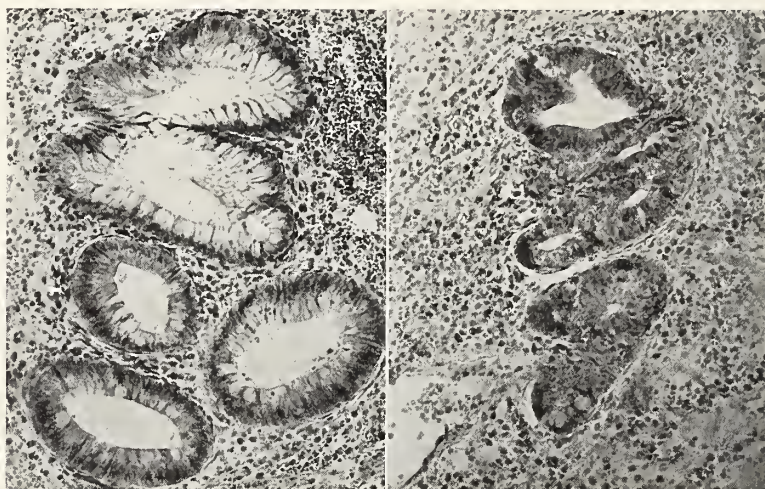


Fig. 3. Malignant change. The acini on the left show simple hypertrophy, the cells contain much mucus and an occasional rare mitotic figure is seen. The acini on the right show absence of mucus, irregular arrangement of cells and numerous mitotic figures.

double contrast method and reported, "A polyp 1.5 by 1.5 cm. in the descending colon just below the crest of the ilium; another smaller polyp in transverse colon adjacent to the splenic flexure, and a third large polyp in the transverse colon just to the right of midline" (Fig. 1).

An operation was advised. After thorough preparation this was performed by one of us (Dixon) on January 10, 1939. The three polyps were readily located. Careful palpation of the ascending colon and right half of the transverse colon showed no abnormality. Resection of the transverse and descending colon was carried out, removing the colon down to the first part of the sigmoid. The ends of the colon were inverted and a side-to-side anastomosis was established between the hepatic flexure and first portion of the sigmoid. The operation was carried out in one stage because the application of clamps for closure of a colostomy would have been extremely difficult and would have been attended by the hazard of injury to the retroperitoneal portion of the duodenum

action from a transfusion on the fourth and sixth postoperative days. However, on the sixth day signs of high intestinal obstruction developed, the output by nasal suction rapidly rising to 3450 c.c. on the ninth day (Fig. 4). Because of fever which had persisted since operation, abdominal tenderness and the absence of isolated, crampy pain, conservative treatment of the intestinal obstruction was instituted. Distention persisted in spite of transduodenal drainage with the Sawyer tube, and a Miller-Abbott type of tube was passed on the thirteenth day. When this entered the jejunum on the fifteenth day there was almost immediate relief of obstruction, as evidenced by diminished output from suction and profuse drainage from the enterostomy tube (Fig. 4). The nasal tube was removed and the diet was gradually increased. Obstruction recurred. This was at first only partial but gradually increased and became nearly complete by the twenty-fifth postoperative day. On the evening of that day he began to pass blood per rectum and by 4 o'clock the next morning a total of 800 c.c. had been passed. The Quick prothrombin

time measured two minutes and twenty-one seconds. A transfusion of 500 c.c. of citrated blood was given in divided amounts.

The abdomen was reopened. A large edematous dilated loop of small intestine was encountered. Because

pain. Since the enterostomy had brought about release of the obstruction at the proximal end of the upper loop, it was possible to introduce vitamin K by nasal tube into the duodenum. Accordingly, 2 c.c. of Klotogen and 6 gm. of bile salts were given by nasal tube;

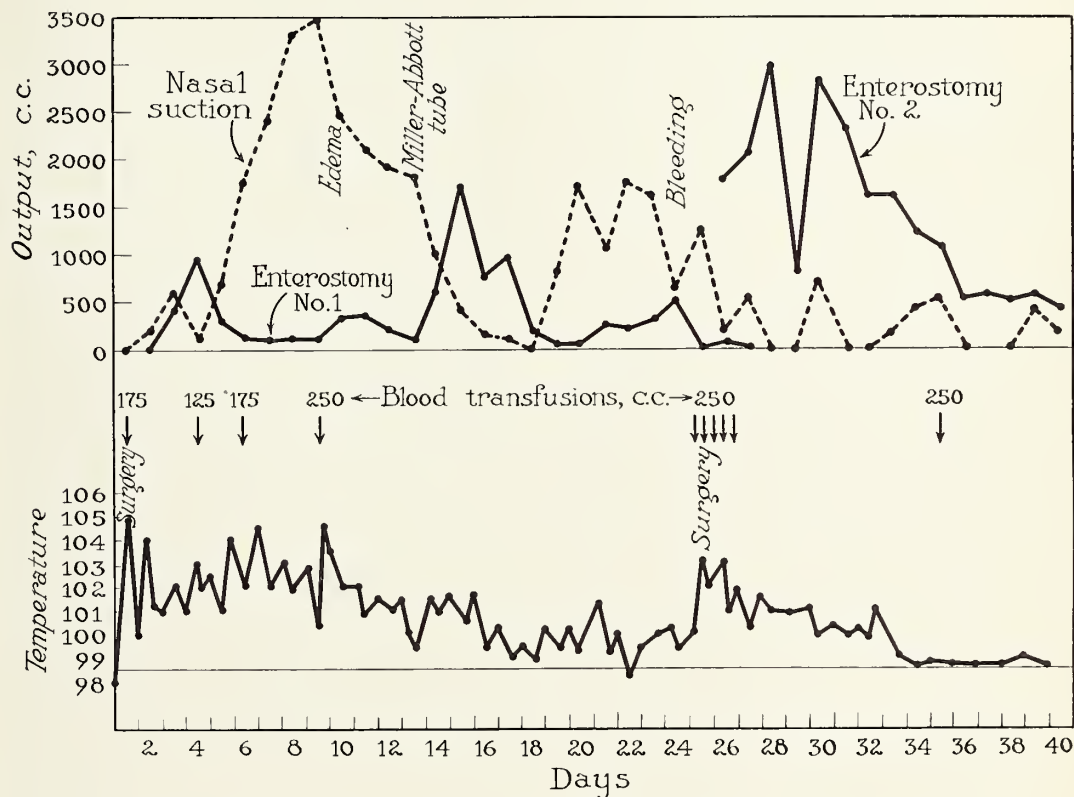


Fig. 4. Postoperative course; relation of febrile reaction to output by nasal suction and enterostomy tubes.

of the critical condition of the patient an exhaustive exploratory procedure was not carried out. An enteric stoma of the Witzel type was established in the dilated loop of bowel. Profuse rectal bleeding continued for eighteen hours following enterostomy, and 750 c.c. more of citrated blood was given by transfusion. The obstruction in the upper end of the dilated loop of bowel was relieved promptly by enterostomy, and this was followed ten days later by release of the obstruction at the lower end of the loop. That the new enterostomy was the means of relieving the obstruction at the upper end of the loop is evident from the fact that material flowed out of the new opening promptly and the output by nasal suction was diminished; release of the lower obstruction ten days later (Fig. 4) was shown by cessation of drainage from the enterostomy tube and by the establishment of a normal fecal content in the bowel.

On the day of operation (after 750 c.c. of blood had been given), the prothrombin time (Quick) had fallen to forty-four seconds. Capsules of vitamin K were given that day through the original enterostomy tube but had to be discontinued because of severe cramping

500 c.c. of citrated blood was also given in the twenty-four hours following operation. By the end of that period all bleeding had ceased, the Quick prothrombin time (Fig. 5) had fallen to twenty-four seconds and the Smith quantitative test revealed 51 per cent normal concentration of prothrombin in the blood. Two cubic centimeters of Klotogen with bile salts was administered on each of the successive four days. At that time, the tube was removed but further therapy with vitamin K was carried out by giving it in capsule form for the next six days. This maintained the Quick prothrombin time between nineteen and twenty-one seconds.

After establishment of the second enteric stoma it was observed that material given by mouth appeared in the drainage from the enterostomy in one hour. To utilize all possible digestive and absorptive surface, the drainage from the proximal enterostomy tube was incubated for four hours and then was introduced into the terminal portion of the ileum through the lower or original enterostomy tube.

During the period of obstruction this patient was also given 25 mg. of betaxin representing 8300 units of vitamin B, and 4 c.c. of cevitic acid (400 mg.) by vein.

On the tenth postoperative day, edema of the eyes, legs and scrotum developed, but prompt relief followed the administration of 110 grains (7.15 gm.) of ammonium chloride by enterostomy tube in three days.

At the last report on April 27, 1939, the patient

undergo malignant transformation. Single polyps display a definite inclination to become malignant. In 5 per cent of the cases of single polyps reviewed by Brust, definite carcinoma developed in the brief period of five years. Unmistakable evidence of early malignant transformation was found in a group of glands in the large polyp in the transverse colon of the patient whose history has just been given in detail.

The problem of postoperative intestinal obstruction is one which taxes the judgment of the surgeon to the utmost. Wangenstein and associates, in a recent article, have reiterated the indications and contraindications for the treatment of intestinal obstruction by suction. If one suspects that there is interference with the blood supply of any loop, immediate exploration is the outstanding indication regardless of the state of the patient. In the present case, the onset of distention was gradual, pain was not severe, there were no definite localizing signs, and because the obstruction was high in the small intestine, conservative treatment was employed. In this instance, nearly complete obstruction persisted from the sixth to the thirteenth postoperative days, and from the nineteenth to the twenty-fifth postoperative days. Regardless of the prolonged obstruction, the urea, chlorides and carbon dioxide combining power of the blood were maintained within nearly normal limits.

We corrected the tendency toward alkalosis and edema which occurred on the ninth day by the administration of ammonium chloride through the enterostomy tube. Deficiency in vitamins B₁ and C was prevented by administration of these substances intravenously. It has been shown through the work of Brinkhous, Smith and Warner, Quick, Dam, Snell, Butt and Osterberg that the presence of bile and a "Koagulation" factor in the intestinal tract are necessary for the formation of prothrombin. It is probable that prolonged starvation and loss of bile from the upper portion of the intestinal tract resulted in the absence of vitamin K from the intestinal tract and subsequent prothrombin deficiency in the case reported. We believe also that the multiple transfusions of fresh blood introduced sufficient prothrombin to tide the patient over temporarily until the enterostomy could be performed and surface for absorption could be made available.

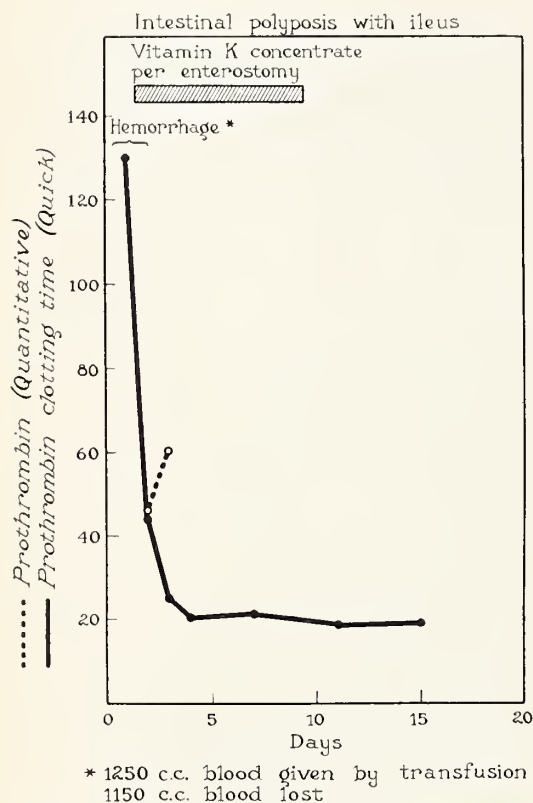


Fig. 5. Prompt return of the prothrombin time (Quick) and quantitative prothrombin to nearly normal values after transfusion and administration of vitamin K concentrate; after the first day the vitamin K was given by nasal tube rather than by enterostomy tube.

weighed 76 pounds, 9 pounds more than when he first came under our care, and he was attending school regularly and leading a normal life. He is to return for fulguration of the polyps in the rectum. Because of the possibility of development of further polyps in the colon and the advantage of early recognition of such lesions, the condition of the intestinal tract should be observed at frequent intervals in the future.

Comment

From the history of rectal bleeding, rectal polyps apparently had been present since the patient was about three months of age. Doehring, Lockhart-Mummery,^{5,6} Miller and Sweet, Wesson and Bargen, Mayo and Butsch, Brust and Rankin and co-workers have frequently emphasized that there is a tendency for rectal and colonic polyps, particularly of the diffuse type, to

Summary

A case of a boy, aged seven years, who had multiple polyps of the colon with malignant change in one of the lesions has been presented. The patient's postoperative course was complicated by intestinal obstruction and ultimately by rectal bleeding which ensued from prothrombin deficiency. With conservative treatment the chemical constitution of the patient's blood was maintained within nearly normal limits until the twenty-fifth postoperative day, in spite of persistent intestinal obstruction. An enterostomy of the Witzel type was sufficient to relieve the obstruction permanently. The rectal bleeding which developed on the twenty-fifth postoperative day on a basis of prothrombin deficiency was treated successfully by multiple transfusions of fresh blood and the administration of vitamin K and bile salts.

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ALLERGY IN GENERAL PRACTICE*

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SINCE various estimates^{1,2} indicate that from 7 to 10 per cent of the total population exhibits some manifestation of the allergic state, the general practitioner of medicine must of necessity give an increasing amount of attention to this phase of medical practice. Discovery of the offending allergens, their elimination, or the use of specific desensitization can be accomplished by following certain practical methods, the cost of which is not excessive and the results good if one has the time and patience to investigate each case to the limits of its possibilities. The following discussion will include those methods which have been found practicable in discovering the causative agent or agents together with brief case reports to illustrate certain principles of investigation.

The factor of hypersensitivity must be considered in many illnesses. We well know its etiologic relationship in hay fever, allergic coryza, bronchial asthma, urticaria, angioneurotic edema

and atopic eczema. There are definite proved instances of gastro-intestinal allergy, allergic migraine and bronchitis. Its importance in such conditions as "spastic colon," "mucous colitis," acne and other more obscure disorders is still largely a matter of romantic speculation.

Clinical Diagnosis

The symptoms in the average case are typical and easily recognized. The more obscure type of case needs to be more critically evaluated. It certainly is not rational to conclude that because a given patient's symptoms are obscure they must be "allergic." In a given doubtful case one or more of the following criteria should be present in order to merit an allergic investigation:

1. Presenting symptoms or objective findings which definitely suggest an allergic state and which can be explained on the basis of smooth muscle spasm or by increased capillary permeability.

*From the Winona Clinic. Read at the annual meeting of the Southern Minnesota Medical Association, New Ulm, Minnesota, September 18, 1939.

2. The occurrence of one or several other manifestations of allergy.
3. A positive family history.
4. The presence of a blood eosinophilia.

History

The value of a careful and detailed history could hardly be overstated. It is equal in value to the more spectacular skin tests. It will frequently indicate contacts and suggest relationships which, when investigated, lead the way to the agent or agents responsible for the patient's symptoms. This is the place where one can do his good work in an obscure case of bronchial asthma. It costs nothing except time. One to several hours of questioning, recording, and study of significant data are required. The history alone, if complete and detailed, coupled with elimination of suspected offenders, will solve many a problem without the use of extensive cutaneous testing. The following case will illustrate this point:

Case 1.—J. M., aged twenty-one, was seen on August 22 with a severe attack of bronchial asthma which required adrenalin for relief. He complained of wheezing and difficulty in breathing, which had recurred with increasing severity during the past month. He had had no previous attacks. Because of the date of onset of symptoms, pollen sensitivity was, of course, suspected. On further questioning it was found that he was employed in the tablet department of a local patent medicine concern for the past six months and that during the past week he had assisted in the manufacture of a tablet containing licorice root. No other changes in his environment could be elicited. A sample of licorice root was obtained and when he inhaled this a typical attack of asthma was produced. A shift to another department was followed by complete relief of symptoms.

The important part of the history resolves itself into the study of two things, closely related: (1) the individual attacks; and (2) a study of the environment and particularly the changes in environment and whether or not these changes are associated with corresponding changes in symptoms.

The Attacks.—Räckemann³ has stressed the importance of a careful study of the individual attacks, noting the exact dates of onset and cessation of symptoms beginning with the very first attack and following through each subsequent one, noting all associated changes in environment and possible causative factors. Sym-

toms that have a definite seasonal incidence corresponding to dates during which certain pollens are prevalent are obviously due to this factor. Hay fever and asthma occurring only in April are probably from trees, in May or June from grasses, in August and September from ragweed. In the winter months they are likely to be due to dusts, feathers, mattress or the like. Urticaria in June or July is probably from some seasonal food. The time of day in which most attacks begin is important. The person who is entirely free from asthma except at night or when he lies down in the afternoon is probably sensitive to some part of his bedding (feather pillow, mattress dust, wool blankets, et cetera). The person who has headaches after Sunday dinner and at no other time probably is sensitive to some favorite dish which he seldom has at any other time. The individual who has abdominal pain and a loose stool after breakfast frequently, and rarely at other times, probably has an intolerance for eggs, coffee or some other breakfast food.

The Environment.—Inquiry into the patient's occupation, its hazards, and especially the dusts or fumes connected with it may lead to the discovery of the cause of trouble. The residence is important. Farm houses have dusts from animals, hay, grain, fertilizers and insecticides which may be quite different from the dusts of cities. Changes in residence, occupation or place of work and the effect on symptoms or the lack of effect, often furnish an important lead.

Case 2.—The following case is that of a young woman, aged 25, a beauty parlor operator, who complained of watering and itching of her eyes, swelling about the eyes, stuffy, "runny" nose and frequent sneezing intermittently for two years. Symptoms occurred at home as well as at work but were more severe while at work and most marked when cutting and combing hair. She had worked at Marshfield for four months during this period and while in Marshfield she was free of symptoms. A study of the various types of preparations used in her work showed that she had used at home a wave set containing gum karaya which had not been used while at Marshfield. A sample of gum karaya powder when inhaled caused a typical severe "hay fever." Elimination of this wave set was followed by complete cessation of symptoms.

Hospital admissions are of great value. Not only does the patient escape from his home but he lands in an environment in which experience has shown that almost all the extrinsic cases of

asthma become symptom-free within a period of five days. When a patient has always lived at home with no change of any kind a study of the history is difficult chiefly because of the absence of history. In such an instance he can be moved away from home and the effect of the change observed.

General Physical and Laboratory Study

Complete physical and laboratory studies are of course, essential. The appearance of the mucous membrane of the nose in allergic coryza is frequently very characteristic: this appears pale, edematous and some thin watery secretion can often be seen. A smear of the nasal secretion shows a predominance (ten per cent or more) of eosinophiles. Leukopenic index studies are of doubtful value in the study of any allergy.

Cutaneous Tests

The elaborate set-ups for skin testing utilized in the large allergy clinics are, of course, financially impracticable in the average office. However, one should have, in addition to pollen extracts, an assortment of at least 100 test materials including all the known "common offenders" and one should be prepared to do both scratch and intradermal testing. Scratch tests are always used in testing for pollens and also for inhalants and foods in highly sensitive individuals. In testing infants and small children the pressure puncture method as advocated by Stoesser⁴ is the method of choice. Intradermal testing is used in all other cases and will frequently show sensitivities not demonstrated by other methods.

Elimination and Trial Diets

In a suspected food allergy, when skin tests are negative or when symptoms are not controlled by diets which exclude foods to which skin reactions have occurred, "elimination" or "trial" diets as advocated by Rowe⁵ and Vaughan⁶ are indicated and are of decided value in localizing these offenders.

Modified Trial Diet

The following initial diet, which consists of foods least likely to cause distress, may be used for a period of five days:

Soup: Lamb or mutton broth, containing rice if desired.

Meat: Lamb or mutton, roasted or served in the form of stew or chops; lamb patties or hash; cold

sliced lamb; casserole of lamb and rice; lamb and rice croquettes.

Cereal: Rice krispies, puffed rice, rice flakes, rice flour, boiled rice; pear juice or butter may be added.

Fruit: Pears, preferably baked with granulated sugar, pear juice, canned pears, stewed pears, or fresh pears without skin and seeds.

Sugar: Granulated or powdered only.

Fat: Butter or lamb fat only.

Seasoning: Salt only.

Beverage: Clear tea or water.

Suggestion.—For breakfast you may eat a lamb chop with puffed rice, rice flakes or steamed rice with butter or sugar, or some of the syrup from a can of pears. Cooked rice may be made into little cakes, and fried lamb, again with rice and canned pears. No coffee, sodas, fountain drinks or candy should be taken, and even chewing gum should be avoided.

After the fifth day add new foods once every fourth to seventh day in the following order: beef, potato, gelatin, carrots, turnips, asparagus, string beans, arrowroot cookies, rye crisp, thin toast, and oatmeal.

Environmental Control

This consists essentially in making the environment in which the patient lives and sleeps as completely dust-free as possible. All sources of inhalant allergens are eliminated. This procedure may be used for diagnosis and for treatment. Rowe⁵ gives the following instructions for the preparation of a dust-free room:

Instructions for the Preparation of a Dust-Free Room

1. Your room should contain only one bed, preferably an iron one. If there is more than one bed in the room, it, too, must be prepared as will be described.

2. All the furniture, rugs, curtains, and drapes must be taken from the room, the clothes closets emptied and the room cleaned as follows:

- a. Seal all the furnace pipes leading into the room. Clean the wallpaper. Scrub the woodwork and the floors in the room and closets. Wax the floors. Washable scatter rugs may be used.

- b. Scrub the bed. Scrub the springs. This must be done outside the cleaned room. If you use a box spring, it must be completely encased as will be described. Cover the mattress, pillows and box springs with dust-proof encasings (covers). The covers must be made of material which is not porous, is allergen-proof. These encasings must be sewed on or otherwise closed up so they are completely air-tight. This must be done outside the cleaned room.

Now set up the bed in the cleaned room, and on it place the cleaned or encased pillows and freshly washed

bedding. All bedding must be made of material which will stand frequent washing. No quilts or comforters should be used.

c. Wooden chairs which have been scrubbed may be used in this room. Rag rugs washed at least once a week may be used on the floor. Plain light curtains washed once a week may be used on the windows.

d. This room must be cleaned thoroughly once a week.

3. You must sleep in this room. All dressing and undressing must be done elsewhere in the house.

Articles of furniture which contain allergenic dusts should be removed from the house, especially from adjoining halls and rooms, if possible. Otherwise each article should be vacuum cleaned thoroughly every day at a time when the patient is away from the house. Following the vacuum cleaning the house should be aired thoroughly.

This is especially valuable in the control of so-called house dust sensitivity. House dust sensitivity is essentially a composite sensitivity. This substance originates primarily from deterioration of furniture stuffing and mattresses. It frequently can not be broken down into other more specific sensitivities and must be considered and treated as an entity.

Case 3.—R.D., a male, aged twenty-eight, gave a history of recurrent asthma since the age of eight, recurring during both summer and winter months and frequently disabling him for periods of from one to several days. Adrenalin was often required for relief. His symptoms were always worse during August and September. He stated that he usually felt well when he came home from work but his chest "tightened up" during the night and his wheezing was most marked on awakening in the morning. Scratch tests with the various pollens gave a marked positive reaction to ragweed. Intradermal testing showed a marked 4-plus reaction to house dust and a 3-plus to mattress excelsior. The remainder of the tests were negative. A program of "allergic cleanliness" was instituted in his bedroom and living room followed by relief of asthmatic symptoms and therefore this regime was continued. Pollen desensitization was begun the following year. He has had no recurrence of symptoms except for mild wheezing associated with upper respiratory infections on two occasions.

Case 4.—A boy, aged twelve, had had an asthma for three years recurring every August and duration several weeks. Symptoms were also severe during the winter months. Symptoms were worse when inside the

house, when playing with cats, and when a certain brand of fly spray was used in the house. Some of his attacks had come on while playing in the barn. His mother stated that his asthma was always worse on a rainy day and that he had a habit of sleeping on an old couch on the front porch on rainy afternoons. Physical examination, laboratory study and radiographs of his chest were essentially negative. A series of scratch tests were negative.

Intradermal testing gave the following positive reactions:

House dust++++
Cow dander+
Dog hair+
Chicken feathers+
Mattress+
Peanuts+
Tomato+
Corn+

The following therapy was advised: (1) Environmental control; (2) advised to dispose of the above-mentioned mattress and to stay away from all the farm buildings except the house; (3) desensitization against ragweed.

This regime was carried out and there has been no recurrence of symptoms.

Specific Desensitization

The value of this method in hay fever is well known. It may also be accomplished in other inhalant allergies. In the majority of cases of food allergy it has not proved successful.

Summary

Rational investigation and control of allergic disorders is by no means a difficult procedure and can readily be carried out in the average office without excessive cost to the practitioner.

Investigation should be continued until every allergic factor has been found and controlled.

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HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN HENNEPIN COUNTY

BY A. S. HAMILTON, M.D.

(Continued from February issue)

Minneapolis Hospitals

(Continued)

REST HOSPITAL was established in 1894 at 2527 Second Avenue South, and was operated as a general hospital admitting both medical and surgical cases. Among those on the staff were Drs. J. W. Little, W. A. Jones, H. W. Jones, and J. W. Bell. It was so operated by trained nurses until 1931, at which time it was taken over by Drs. Arthur S. Hamilton and Hewitt B. Hannah for the care of nervous and mental cases exclusively.

The SWEDISH HOSPITAL was incorporated January 4, 1898, and opened for the reception of patients in the old Judge Cornell residence at 1419 Ninth Street South, with a capacity of twenty-five beds. The first year, 238 patients were cared for. The training school for nurses was opened in 1899, and in 1900 "The Swedish Hospital and Nurses' Institute," an auxiliary corporation, was formed which purchased ground and erected a new hospital at the corner of Tenth Avenue South and Eighth Street.

The first medical staff consisted of Drs. A. E. Anderson, O. A. Fliesburg, Alfred Lind, Joseph A. Prim, and C. J. Ringnell; but the following are included in a list from another source as those serving on the original staff: *Surgery*—Drs. C. J. Ringnell, A. Soderlind, U. G. Williams, C. M. Kistler; *Medicine*—Drs. C. J. Lind, S. P. Rees, J. M. Kistler, A. E. Anderson, Gilbert Seashore, B. Dearborn; *Eye and Ear*: Drs. H. McL. Morton and J. G. Ericson; *Nose and Throat*: Dr. E. H. Parker; *Diseases of Women and Children*: Drs. Alfred Lind, O. A. Olson, J. H. Rishmiller, A. E. Johnson, J. Frank Corbett.

The hospitals, medical societies and medical celebrities of the current century are too recent to include in the early history of Hennepin County Medicine. Nineteen hundred has been chosen as the fitting end of this volume. The events and personalities that have crowded upon each other in the space of a generation since the close of the century must have space for their dramatic chronicle in a later volume, for which, perhaps, the efficient secretaries of the present day are preparing more accurate and more accessible source-material, if not more picturesque.

The following is the list of officers of the Hennepin County Medical Society so far as I have been able to learn them. In most instances the names are taken from notices published in the papers at the time of the election, and a few are taken from directories, which have not been found a very satisfactory source:

1855—President, A. E. Ames
Vice President, C. L. Anderson
Secretary, Dr. Wheelock
1862—President, A. E. Ames
Secretary, R. H. Ward

1867—President, A. E. Ames
Secretary, N. B. Hill
1868—Presidents, A. E. Ames and N.
B. Hill
Secretary, N. B. Hill

HISTORY OF MEDICINE IN MINNESOTA

- 1869—President, A. E. Ames
Vice President, N. B. Hill
Secretary, W. F. Hitchcock
- 1870—President, A. E. Ames
Vice President, N. B. Hill
Secretary, Geo. H. Keith
- 1871—President, A. E. Ames
Vice President, N. B. Hill
Secretary, W. F. Hutchinson
- 1872—President, A. E. Ames
Vice President, N. B. Hill
Secretary, O. J. Evans
- 1873—President, A. E. Ames
Vice President, N. B. Hill
Secretary, O. J. Evans
- 1874—Presidents, A. E. Ames and
Chas. Simpson
Vice President, Chas. Simpson
Secretary, C. C. Clarke
- 1875—President, C. G. Goodrich
Vice President, O. J. Evans
Secretary, A. S. Salisbury
- 1877-1878—President, Edwin Phillips
Vice President, J. W. Murray
Secretary, C. L. Wells
- 1878-1879—President, J. W. Murray
Vice President, A. H. Salisbury
Secretary, C. L. Wells
- 1879-1880—President, A. H. Lindley
Vice President, O. J. Evans
Secretary, C. L. Wells
- 1880-1881—President, O. J. Evans
Vice President, C. L. Wells
Secretary, A. C. Fairbairn
- 1881-1882—President, Chas. Simpson
Vice President, A. C. Fairbairn
Secretary, N. Spring
- 1883-1884—President, C. L. Wells
Vice President, R. J. Hill
Secretary, F. E. Towers
- 1884-1885—President, R. J. Hill
Vice President, F. E. Towers
Secretary, M. E. Woodling
- 1885-1886—President, Woodling or Salisbury
- 1888-1889—President, E. J. Brown
Vice President, W. J. Byrnes
Secretary, C. J. Spratt
- 1889-1890—President, W. J. Byrnes
Vice President, J. H. Stuart
Secretary, G. W. Bass
- 1890-1891—President, J. Harlan Stuart
Vice President, J. W. McDonald
Secretary, G. W. Bass
- 1891-1892—President, J. Harlan Stuart
Secretary, G. W. Bass
- 1892-1893—President, W. A. Hall
- 1893-1894—President, J. W. McDonald
Secretary, A. F. Irwin
- 1894-1895—President, C. G. Weston
Secretary, A. F. Irwin
- 1895-1896—President, W. A. Jones
- 1896-1897—President, J. Warren Little
Secretary, J. W. Dudley
- 1897-1898—President, J. C. Cockburn
Secretary, W. B. Pineo
- 1898-1899—President, L. A. Nippert
Vice President, R. E. Cutts
Secretary, F. A. Knights
- 1899-1900—President, H. B. Sweetser
Vice President, Knut Hoegh
Secretary, F. A. Knights
- 1900-1901—President, A. W. Abbott
Vice President, C. A. Erdman
Secretary, F. A. Knights
- 1901-1902—President, H. L. Staples
Vice President, F. C. Todd
Secretary, A. E. Benjamin
- 1902-1903—President, J. W. Bell
Vice President, F. C. Todd
Secretary, F. A. Knights
- 1904—President, C. H. Hunter
Vice President, W. E. Rochford
Secretary, F. A. Knights
- 1905—President, D. Owen Thomas
Vice President, A. B. Cates
Secretary, F. A. Knights
- 1906—President, F. C. Todd
Vice President, J. A. Crosby
Secretary, C. H. Bradley
- 1907—President, J. E. Moore
Vice President, A. T. Mann
Secretary, C. H. Bradley
- 1908—President, F. A. Knights
Vice President, J. G. Cross
Secretary, C. H. Bradley
- 1909—President, J. D. Simpson
Vice President, J. F. Corbett
Secretary, C. H. Bradley
- 1910—President, C. A. Donaldson
Vice President, C. A. Lapierre
Secretary, C. H. Bradley
- 1911—President, Thomas F. Quinby
Vice President, H. E. Cary
Secretary, C. H. Bradley
- 1912—President, C. H. Bradley
Vice President, J. H. Rishmiller
Secretary, E. J. Huenekens
- 1913—President, H. H. Kimball
Vice President, Geo. D. Haggard
Secretary, E. J. Huenekens
- 1914—President, C. A. McCollom
Vice President, Robert Williams
Secretaries, E. J. Huenekens and
and C. N. Brooks
- 1915—President, R. E. Farr
Vice President, J. G. Cross
Secretary, S. R. Maxeiner
- 1916—President, J. G. Cross
Vice President, A. S. Hamilton
Secretary, S. R. Maxeiner
- 1917—President, A. S. Hamilton
Vice President, J. C. Litzenberg
Secretaries, S. R. Maxeiner, R.
T. LaVake, and C. W. Pettit
- 1918—President, E. K. Green
Vice President, J. F. Corbett
Secretary, C. W. Pettit
- 1919—President, J. C. Litzenberg
Vice President, C. W. Watson
Secretary, C. W. Pettit
- 1920—President, J. Frank Corbett
Vice President, Angus Morrison
Secretary, C. W. Pettit
- 1921—President, Geo. Douglas Head
Vice President, John Butler
Secretary, R. T. LaVake
- 1922—President, A. E. Benjamin
Vice President, A. E. Hedback
Secy. Treas., R. T. LaVake
- 1923—President, Fred L. Adair
Vice President, C. B. Wright
Secy.-Treas., R. T. LaVake
- 1924—President, C. B. Wright
Vice President, J. M. Lajoie
Secy.-Treas., R. T. LaVake
- 1925—President, Emil S. Geist
Vice President, F. A. Erb
Secy.-Treas., R. T. LaVake
- 1926—President, F. A. Erb
Vice President, S. R. Maxeiner
Secy.-Treas., R. T. LaVake
- 1927—President, S. R. Maxeiner
Vice President, A. E. Hedback
Secy.-Treas., Erling W. Hansen

HISTORY OF MEDICINE IN MINNESOTA

1928—President, A. E. Hedback Vice President, E. L. Gardner Secy.-Treas., Erling W. Hansen	1932-1933—President, Erling W. Hansen Vice President, C. A. Stewart Secy.-Treas., O. J. Campbell
1929—President, N. O. Pearce Vice President, E. L. Gardner Secy.-Treas., Erling W. Hansen	1933-1934—President, C. A. Stewart Vice President, Martin Nordland Secy.-Treas., O. J. Campbell
1930—President, E. L. Gardner Vice President, S. H. Baxter Secy.-Treas., Erling W. Hansen	1934-1935—President, J. M. Hayes Vice President, W. H. Aurand Secy.-Treas., O. J. Campbell
1931—President, S. H. Baxter Vice President, Moses Barron Secy.-Treas., Erling W. Hansen	1935-1936—President, R. R. Cramer Vice President, J. H. Simons Secy.-Treas., O. J. Campbell
1931-1932—President, Moses Barron Vice President, J. C. Michael Secy.-Treas., Erling W. Hansen	

In the above list of presidents, names are lacking for 1876, 1882-1883, 1886-1887, and 1887-1888. To fill these vacancies we have the names of Dr. F. E. Towers and either Dr. Woodling or Dr. Salisbury, so that I am still lacking the names of at least two of the ex-presidents. The year 1902 marks the change in the election of president from the middle to the end of the year. On this account, Dr. J. W. Bell served as president all of the year 1903 and half of the year 1902.

Health Officers

The Minneapolis Board of Health was organized in 1867 upon the incorporation of the city. This first board, or Sanitary Committee as it was called, consisted of Drs. A. E. Ames, N. B. Hill and A. H. Lindley. The last named was designated as Health Officer.

Since 1889, this title was supplanted by that of Commissioner of Health according to the proceedings of the City Council.

In the Council proceedings of 1879-1880 the office of City Physician is first mentioned. Under an act of the legislature, passed April 21, 1891, the Board of Charities and Corrections was organized, which biennially appointed a city physician and delegated to him the duties of Superintendent of Hospitals.

In 1919, the Board of Charities and Corrections was superseded by the Board of Public Welfare by act of the legislature. But in 1913, a civil service commission was organized in Minneapolis which provided that all of the employees of the Board of Public Welfare, except the Commissioner of Health, be subject to suspension or dismissal only by the Civil Service Commission. The dual position of city physician and superintendent of hospitals was continuous then under civil service, until the organization of the Board of Public Welfare in 1919. According to the charter provision arising out of the act which established the Board of Public Welfare, the city physician must be a licensed practitioner of medicine in Minnesota. In case the superintendent of hospitals is not a duly licensed practitioner, a city physician must be appointed who qualifies as such.

1867-1868	Dr. A. H. Lindley.....	Health Officer
1869-1871	Dr. W. H. Leonard.....	Health Officer
1871-1872	Dr. W. H. Leonard.....	Health Officer
1872-1875	Dr. Charles Simpson.....	Health Officer
1875-1876	Dr. G. F. Townsend.....	Health Officer
1877-1878	Dr. A. A. Ames.....	Health Officer
1878-1879	Dr. O. J. Evans.....	Health Officer
1879-1880	Dr. A. H. Salisbury.....	Health Officer
1880-1881	Dr. O. J. Evans.....	Health Officer
	Dr. S. M. Spaulding.....	City Physician
1881-1882	Dr. A. H. Salisbury.....	Health Officer, City Physician
1882-1883	Dr. J. C. Cockburn.....	Health Officer, City Physician

HISTORY OF MEDICINE IN MINNESOTA

1883-1884	Dr. J. C. Cockburn.....	Health Officer
	Dr. A. B. Cates.....	City Physician
1884-1885	Dr. T. F. Quinby.....	Health-Officer
	Dr. C. W. Drew.....	City Physician
1885-1886	Dr. T. F. Quinby.....	Health Officer
	Dr. S. H. Van Cleve.....	City Physician
1886-1887	Dr. T. F. Quinby.....	Health Officer
	Dr. S. H. Van Cleve.....	City Physician
1887-1888	Dr. Samuel S. Kilvington.....	Health Officer
	Dr. James H. Dunn.....	City Physician
1889	Dr. Samuel S. Kilvington.....	Commissioner of Health
1890	Dr. Samuel S. Kilvington.....	Commissioner of Health
	Dr. C. A. Chase	City Physician
1891	Dr. E. S. Kelley.....	Commissioner of Health
	Dr. C. A. Chase	City Physician
1892	Dr. E. S. Kelley.....	Commissioner of Health
	Dr. C. A. Chase.....	City Physician
1893	Dr. E. S. Kelley.....	Commissioner of Health
	Dr. C. G. Weston.....	City Physician
1894	Dr. E. S. Kelley.....	Commissioner of Health
	Dr. C. G. Weston.....	City Physician
1895	Dr. H. N. Avery.....	Commissioner of Health
	Dr. C. G. Weston.....	City Physician
1896	Dr. H. N. Avery.....	Commissioner of Health
	Dr. C. G. Weston.....	City Physician
1897	Dr. H. N. Avery.....	Commissioner of Health
	Dr. C. G. Weston.....	City Physician
1898	Dr. H. N. Avery and Dr. A. K. Norton.....	Commissioner of Health
	(Dr. Avery died suddenly at Forman, N. D., and Dr. Norton became Commissioner.)	
	Dr. C. G. Weston.....	City Physician
1899	Dr. A. K. Norton.....	Commissioner of Health
	Dr. W. J. Byrnes.....	City Physician
1900	Dr. A. K. Norton.....	Commissioner of Health
	Dr. W. J. Byrnes.....	City Physician
1901	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Henry S. Nelson.....	City Physician
1902	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Henry S. Nelson.....	City Physician
1903	Dr. P. M. Hall.....	Commissioner of Health
	Dr. George E. Ricker.....	City Physician and Supt. of City Hospital
1904	Dr. P. M. Hall.....	Commissioner of Health
	Dr. George E. Ricker.....	City Physician and Supt. of City Hospital
1905	Dr. P. M. Hall.....	Commissioner of Health
	Dr. E. H. Beckman.....	City Physician
1906	Dr. P. M. Hall.....	Commissioner of Health
	Dr. E. H. Beckman.....	City Physician
1907	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Ole E. Linjer.....	City Physician
	(Died in office Dec. 11, 1907. Completed unexpired term of Dr. Beckman and a few months of his own. He had been Assistant City Physician.)	
1908	Dr. P. M. Hall.....	Commissioner of Health, City Physician
1909	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Herbert O. Collins.....	City Physician
1910	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Herbert O. Collins.....	City Physician
1911	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Herbert O. Collins.....	City Physician
1912	Dr. P. M. Hall.....	Commissioner of Health
	Dr. Herbert O. Collins.....	City Physician
1913	Dr. C. E. Dutton.....	Commissioner of Health
	Dr. Herbert O. Collins.....	City Physician and Supt. of City Hospital

HISTORY OF MEDICINE IN MINNESOTA

1914	Dr. C. E. Dutton.....	Commissioner of Health
1915	Dr. C. E. Dutton.....	Commissioner of Health
	(Office vacated June 11, 1915.)	
	Dr. H. M. Guilford.....	Acting Commissioner of Health
1916	Dr. H. M. Guilford.....	Acting Commissioner of Health
1917	Dr. H. M. Guilford.....	Commissioner of Health
	(Elected Jan. 2, 1917, for ensuing term.)	
1918	Dr. H. M. Guilford.....	Commissioner of Health
1919	Dr. H. M. Guilford.....	Commissioner of Health
	(Dr. Guilford died. Maurice King was elected as his successor on Feb. 28, 1919.)	
1920	Dr. F. E. Harrington.....	Commissioner of Health
1921	Dr. F. E. Harrington.....	Commissioner of Health
1922	Dr. F. E. Harrington.....	Commissioner of Health
1923	Dr. F. E. Harrington.....	Commissioner of Health
1924	Dr. F. E. Harrington.....	Commissioner of Health
1925	Dr. F. E. Harrington.....	Commissioner of Health
1926	Dr. F. E. Harrington.....	Commissioner of Health
1927	Dr. F. E. Harrington.....	Commissioner of Health
1928	Dr. F. E. Harrington.....	Commissioner of Health
1929	Dr. F. E. Harrington.....	Commissioner of Health
1931	Dr. F. E. Harrington.....	Commissioner of Health
1932	Dr. F. E. Harrington.....	Commissioner of Health
1933	Dr. F. E. Harrington.....	Commissioner of Health
1934	Dr. F. E. Harrington.....	Commissioner of Health
1935	Dr. F. E. Harrington.....	Commissioner of Health
1936	Dr. F. E. Harrington.....	Commissioner of Health

(For list of Superintendents of City Hospital (General Hospital), see under Hospitals.)

Coroners

The following physicians have served as coroners in Hennepin County since 1869, at which time David Morgan is reported as being appointed county coroner: David Morgan, Charles Blecken, O. P. Chilstrom, P. Nelson, A. C. Fairbairn, R. J. Hill, Frank E. Towers, Wm. J. Byrnes, W. P. Spring, George E. Dennis, Henry S. Nelson, U. G. Williams, J. M. Kistler, and Gilbert Seashore (the latter having now served as coroner for twenty-eight years).

(To be continued in April issue.)

President's Letter

MAN follows the path of least resistance. It is very easy to ride along contentedly until a sudden jolt arouses us from our lethargy. It required several law suits involving large amounts to arouse sufficient interest on the part of organized medicine to study systematically disease caused by industry. Possibly these verdicts have been excessive and some of them unwarranted. But the fact remains that they were awarded.

The largest verdicts have been in cases involving dust. Eminent physicians, specialists of national repute, have testified against each other in many of these cases as to whether the individual had tuberculosis or silicosis or both as a result of dust.

Various other diseases, including lung diseases of different kinds, syphilis, kidney disease, dermatoses, and even appendicitis, have been declared by the courts to be compensable diseases.

This has resulted in intensified study on the part of organized medicine. The American Medical Association formed a new department in 1937 called the Council on Industrial Health. This Council held its second annual Congress on Industrial Health in Chicago last month, Northwestern Medical University formed a Department of Industrial Medicine in 1936, which is supported jointly by a group of industries and the University. This department held its third annual Symposium on Industrial Medicine in September. Other medical schools are following suit. At these meetings papers were presented by very able men on disabilities caused by such hazards as dust, welding, heat, and electricity, as well as various diseases which may be caused or aggravated by work in various lines of industry.

In Wisconsin the Industrial Commission is urging industry to institute periodic examinations of all employees. In all this organized labor seems to coöperate. The International Harvester Company has required an annual examination of every employee for many years and in addition a chest film every third year. This includes workers in their group of mines on the Mesaba Range. Many of the other mining companies are now doing the same.

At the second Annual Congress of Industrial Health last month, a paper was read by Terry C. Foster, U. S. Office of Education, Washington, D. C., on Rehabilitation in Relation to Medical Practice and Workman's Compensation Procedure which indicates the new trend of thought. The tendency in the past has been to care for a badly injured man, restore him to the best possible condition, testify for him before the compensation board, and then drop him. But this program is no longer considered sufficient. Means should be developed whereby the physician may be the advisor to some rehabilitation group which will train the crippled individual. If possible, he should be returned to his usual occupation. If that is impossible, he should be given training along some line of work that he can do so that he may become wholly or at least partly self-supporting. Then the physician, the rehabilitation group and the Compensation Board working together can more equitably estimate the disability.

A new committee has been formed in our State Association to study and investigate these problems, to learn what is being done elsewhere, and to make suggestions and advise procedure to be followed. It is called the committee on Industrial Hygiene and Occupational Disease. This is a large subject and a most important and timely one.

BERTRAM S. ADAMS, M.D., President
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

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MORTALITY TRENDS IN 1939

THE mortality experience of the Metropolitan Life Insurance Company, paralleling as it does that of the country as a whole, is each year most interesting. The report of this company in its bulletin for January, 1940, indicates the trend of national health in 1939, and also during the past decade.

The health of the country apparently continued during 1939 at a high level, although the mortality rate may prove to have been slightly higher

in the general population than the all-time low rate of 1938.

The marvelous advances in the feeding and care of infants in recent years have in large measure accounted for the great increase in life expectancy in our population. The continued decrease in mortality from the contagious diseases has further increased the life expectancy to the present high record of sixty-two years. While vaccination can be given some credit for the continuous reduction in diphtheria, other unknown factors account for the decrease in other contagious diseases.

Publicity campaigns probably should be given some credit for the continuous reduction in infant and maternal mortality. Certainly the concerted efforts directed to combat tuberculosis deserve the credit for halving the mortality from this disease in the past ten years and for cutting it to one-fifth of that in 1911.

One of the outstanding accomplishments in 1939 was the marked reduction (15 per cent) in the mortality rate from pneumonia in spite of an increase in mortality from influenza. It is safe to predict that the new dye therapy will show a marked further improvement in this regard unless the savings in lobar pneumonia are offset by an influenza epidemic.

It is yearly astonishing to learn that deaths from accidents of all kinds continue to decline. The high toll from automobile accidents each year is tremendous and impresses itself on our minds. Even automobile deaths in 1939, however, were slightly lower than in 1938 and the lowest since 1926, in spite of increased automobile traffic. The great saving in deaths from all accidents has been in industry, and has been so great that the number of fatal accidents has actually decreased in recent years.

The lowered birth rate and restriction of immigration in recent years and the increase in life expectancy have all resulted in a higher percentage of the population being in the latter decades of life. Thus the mortality from diseases incident to the later years of life—cancer, heart disease and diabetes—have naturally shown an increase in 1939 as well as in previous years.

The increase of 30 per cent in cancer mortality in the last ten years may not be actually as great when the improved methods of diagnosis of internal cancer are considered. This is a disease, however, which requires concentrated effort in order to attain earlier detection when cure is possible. Deaths due to coronary artery disease last year were nine times those so diagnosed ten years ago. Allowing for the possibility that the profession may be coronary-minded and may be over-diagnosing the disease, the actual increase in incidence of this disease and its appearance so frequently in the fourth and fifth decades is cause for alarm. It seems paradoxical that with the marked improvement in the treatment of diabetes the mortality has continued to increase in recent years with the exception of 1938, when there was a slight decline. Although treated diabetics live longer, the mortality rate for this disease is still increasing. Not only is the disease more often detected but the incidence of the disease has definitely been on the increase. This must be related to the high per capita sugar consumption in this country.

Of interest, too, is the drop of 20 per cent last year in the mortality attributed to alcoholism. The fact that the death rate was one-third of that ten years ago suggests that the American public is developing a little more sanity in its use of alcohol.

The improvement in the general health of the American people as reflected by the decrease in mortality is due to many factors. Practicing physicians should not forget the important part played by the sanitary engineer in providing clean water supply. Deaths from typhoid fever have been reduced to less than one per 100,000 population. Public health activities and a more health-minded public also account to some extent for the improvement.

CORONARY OCCLUSION AND THROMBOSIS

IN 1912, Herrick first called attention to the syndrome of coronary thrombosis. A full ten years elapsed before the diagnosis came to be commonly made.

The typical syndrome consists of the sudden onset of precordial pain or distress lasting several hours with a fall in blood pressure, pallor and cold perspiration and the development of an elevation of temperature, a leukocytosis and at

times a pericardial friction rub. Changes in the electro-cardiogram confirm this diagnosis.

Such a typical picture is not difficult to diagnose, but the atypical case may prove disconcerting. There may be vomiting and epigastric location of the pain, or the pain may not be severe and the blood pressure may not be low.

The interpretation of cardiac pain in terms of the pathologic process in the heart and particularly in the coronary vessels is important to every physician. The cause of angina pectoris is now recognized as being an anoxemia of the heart muscle. When this lasts a few minutes it is due to a temporary lack of sufficient oxygen for the needs of the heart muscle at that time and is generally due to an arteriosclerotic narrowing of one or more coronary vessels. Prolonged duration of the pain is likewise due to anoxemia of the heart muscle and the cause is usually a thrombosis or an occlusion in a coronary vessel.

The terms coronary thrombosis and coronary occlusion are commonly used interchangeably. That the two processes are not identical is clearly shown in a recent article by Blumgart, Schlesinger and Davis.* These authors selected all cases in which there was clinical or necropsy evidence of heart disease in a consecutive series of autopsies. The coronary vessels were injected with a colored radio opaque solution, x-rayed and then dissected. The simultaneous injection of colored material gave information as to regions supplied by right and left coronary arteries or both.

In brief, these authors showed that in the presence of coronary arteriosclerosis with narrowing of the vessels collateral circulation is established between the right and left coronary arteries where it is needed. Whether these connecting arteries are newly formed or are enlargement of already existing minute vessels known to be present normally is not known. One of the startling facts which they have proved is the existence of coronary occlusion in not only one but, at times, in two or three main coronary branches in many cases in which there was no clinical history of symptoms of coronary thrombosis or even angina pectoris. The previous development of collateral vessels is given as the explanation for the ab-

*Blumgart, Herman L., Schlesinger, Monroe J., and Davis, David: studies on the relation of the clinical manifestations of angina pectoris, coronary thrombosis and myocardial infarction to the pathological finding. *Am. Heart Jour.*, 19:1, (Jan.) 1940.

sence of symptoms. Just as startling is the absence of old infarcts in these cases and this absence is explained also by the presence of collateral vessels.

There is, then, a distinction between coronary occlusion and coronary thrombosis. The former may occur without producing symptoms of heart pain because of the presence of newly developed collateral circulation. Such circulatory change does reduce the blood supply to the heart muscle and angina pectoris may be present if oxygen supply to the muscle is not sufficient to meet the demand. The picture of prolonged heart pain, pallor, lowered blood pressure, leukocytosis and fever should be diagnosed coronary thrombosis and indicates the formation of an infarct of the heart muscle. These patients require at least six weeks of absolute rest.

MEDICAL LITERATURE

IN the Lloyd Roberts lecture with the above title delivered before the Medical Society of London on November 16, 1939 (*The Lancet*, 2: 21, 1939), Sir Robert Hutchison, President of the Royal College of Physicians, discusses in detail the bulk of medical literature in the world, its quality and how to cope with the enormous surfeit of it which he takes pains to show really exists. In his analysis of the periodical situation he quotes freely from the Schorstein Memorial lecture on "Medical Periodical Literature" by Professor William Bulloch, F.R.S. (*British Medical Journal* 2:810, 1935), stressing particularly the latter's estimate that there are over 5,000 medical periodicals of one sort or another in the world, while others, he states, have put the number as high as 7,000. Put in another way, states Professor Bulloch, "there have been, on an average, two articles published on tuberculosis alone every day for the last forty years."

Inferentially the blame for this situation is placed at the door of the United States, for it is stated in the Hutchison lecture that Great Britain produces about 130 medical journals and everyone knows that the output of the other European countries is not large. But an examination of the 1938 A.M.A. Directory shows that in this country, including the Philippine Islands, Puerto Rico and Canada, there are but 224 medical journals altogether. Where, then, are the other thousands? The answer is to be found in the Bul-

loch lecture where, in an attempt at facetiousness, the well known pathologist gave the names of some, such as the "Doctor's Factotum." Evidently every trade organ in this country has been included in the term "medical periodicals of one sort or another" and this, to us, is patently ridiculous. Regrettably it weakens the argument but it does not alter the fact that nevertheless there is plenty of room for improvement in the field of regular medical literature everywhere, both in the periodicals and in the books. The rest of the Hutchison lecture contains some very valuable discussion of the weaknesses which still infest both fields and makes a number of useful suggestions. It is unfortunate that it is marred by the irrelevancies and inaccuracies which have been pointed out.

GILBERT COTTAM.

ECONOMIC QUESTIONS

BEING doctors and not political economists, here are a few questions we should like to have answered.

Why do wealthy citizens establish Foundations, the activities of which are largely devoted to the establishment of socialism in medicine?

Why do certain individuals who have prospered by reason of their own industry and initiative become parlor socialists and even communists, ignoring the fundamental biological necessity so tersely stated in the phrase "Root, hog, or die"?

Can human nature resist the temptation to spend money in riotous living and to ignore the virtue of saving if there is assurance that thrifty neighbors through taxes will furnish support in later years of poverty?

Is there any reason why the medical profession should be socialized and not lawyers and merchants?

Why do certain advocates believe that a governmental bureau with a large personnel and a lot of red tape can supply medical care to our citizens without an enormous increase in total cost?

Why do the same individuals believe that in a panel system patients will receive the same individual medical attention as they now do?

What country with any form of government sickness insurance has better health and a lower death rate than the United States?

What in case of free medical service is to prevent neurotics from making life intolerable for salaried government physicians by reason of needless day and night calls?

What reason is there to believe that there would be a common objective for the worker relating his subjective symptoms for the purpose of obtaining certification for sickness benefit, and for the doctor whose object is to cure the worker?

Why does our government continue to buy gold at a pegged price when gold is no longer a medium of national or international exchange?

Why does our government continue to buy silver at a pegged price when it is considered the height of folly for an individual to pay more for anything than is necessary?

Why does our government deliberately favor higher wages and thus higher cost of production, which everyone knows necessitates a lowering of consumption of goods, a higher tariff and less foreign trade?

Why do some believe that the economic law of supply and demand can be circumvented by legislation?

OF GENERAL INTEREST

Dr. Max Kern of Rogers, Minnesota, son of Dr. M. J. Kern of Saint Paul, has moved to Freeport, Minnesota.

* * *

Dr. William J. Noonan has opened an office at 515 Medical Arts Building, Minneapolis, for the practice of urology.

* * *

Dr. H. T. Sherman, formerly of Mantorville, has moved to Nerstrand, Minnesota, taking over the practice left open last October when Dr. R. Wilkowske moved to Owatonna.

* * *

Dr. Robert Maves, who has been associated with Dr. F. C. Westerman in Montgomery, has purchased a practice in Burien City, Washington, and will follow his profession in that city.

* * *

Dr. Lloyd Gilman, who has been practicing medicine at Osceola, Wisconsin, has moved to Atwater, Minnesota, where he will share offices with his brother, Dr. Donald Gilman, who is a dentist.

Dr. C. L. Farabaugh, who has had his practice in Owatonna since 1931, has announced the opening of offices at 3657 Emerson Avenue North, Minneapolis. He will specialize in treatment of diseases of the eye.

* * *

Dr. C. B. Abbott, Springfield, Minnesota, is in Mexico City, recuperating from a cholecystectomy. He expects to return to his practice in Springfield the latter part of March.

* * *

Dr. David Schuele, who has been associated with the Gamble Clinic of Albert Lea for more than two years, is now located in Chatfield, Minnesota. He will be associated in practice with Dr. Charles Wodruff, who has been practicing in Chatfield for thirty-nine years.

* * *

Dr. A. C. Strachauer has been named chief of staff of Eitel Hospital for 1940, succeeding Dr. J. C. Litzenberg. Dr. Walter Ude succeeds Dr. E. A. Bedford as assistant chief of staff and Dr. Theodore Stebbins succeeds Dr. U. S. Anderson as secretary.

* * *

Dr. Edward D. Churchill, John Homans professor of surgery at Harvard Medical School, will deliver the seventh E. Starr Judd Lecture at the University of Minnesota, March 14, 1940. His subject will be "Surgery of the Lungs."

* * *

The Foundation Prize of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons of \$150 is again open to internes or those practicing this specialty. Manuscripts are due by June 1, 1940. For further information, address Dr. James R. Bloss, Secretary, 418 Eleventh Street, Huntington, West Virginia.

* * *

Dr. Arthur E. Karlstrom has been appointed director of hygiene and health education in the Minneapolis public schools. Dr. Malvin J. Nydahl, whom Dr. Karlstrom succeeds, has accepted appointment as head of the crippled children's bureau of the state social security department. Dr. Karlstrom, a graduate of the University of Minnesota Medical School in 1935, served as director of the public schools' child study department for a year and one-half after internship at the University Hospital and a teaching fellowship at Strong Memorial Hospital in Rochester, N. Y. He also has been clinical instructor of the university pediatrics department and a member of General hospital staff.

The Finnish Relief Fund

Physicians are urged to make any contributions they can to the Finnish Relief Fund sponsored by Mr. Herbert Hoover, and to be devoted to supplying the Finnish civilian population with food and clothing. The need is great. Even small contributions will be gratefully received. All checks should be made payable to the Finnish Relief Fund, Inc., and sent to the Medical Division of the Fund, 420 Lexington Avenue, New York City.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

REPORT OF THE SURVEY OF MEDICAL CARE

The report of the Survey of Medical Care in the United States which has been compiled by the Bureau of Medical Economics of the American Medical Association has just been published. It includes reports from thirty-eight constituent state medical societies and 623 of the component county medical societies. Replies were received from 22,397 physicians and dentists. Of this number 17,000 were returned by physicians, who constitute 27 per cent of the physicians in active practice in the areas surveyed.

This survey covered a total population of 49,278,083 and is more fully representative of both urban and rural populations than any previous similar investigation. The survey was not devised primarily to produce a statistical report, but rather to obtain a consensus of opinion after a study of the facts by those close to the situation as to the need and supply of medical care.

Value Enhanced

The value of the report is enhanced by the cooperation received from a large number of allied agencies. Other than from physicians and dentists, replies were received from 16,290 sources. These include reports from the following allied organizations:

Hospitals—1,336
Nurses organizations—1,888
Health Departments—839
Welfare and Relief Agencies—1,896
Schools and colleges—3,853
Other organizations—1,963

The combined data turned in by these various agencies should give a fairly accurate idea as to the need and supply of medical care. Not alone is this information made available, but practical suggestions for the improvement of conditions found were made in many instances. Examination of the data reported and of the opinions expressed justifies the conclusion that there is no

important section of the population of the United States that now fails to receive the medical care it *needs* and *desires*.

Care of Indigent Inadequate

It would seem that the greatest inadequacies exist in the indigent groups which are supposed to be looked after by government agencies. This is indeed a sad commentary on a situation which might be taken care of if the agencies involved were properly managed.

The report is quite contrary to the data on which the National Health Program is based. It is high time the public was brought to realize the fallacies and exaggerations embodied in the National Health Report.

Frank criticism of the conditions involving medical care in various localities and detailed suggestions for their improvement are made by many of the county societies. These are specific, constructive criticisms as to defects for which a remedy is available and a program for future improvement is included in many instances. The following statements are quoted from the Report of the Survey:

Program Is Diverse

"The picture that takes shape out of all these details of facts and opinions appears to be one of a fairly well correlated and constantly improving program of medical care. This program has not been planned in detail and then applied by authority, but has grown and developed with infinite diversity to correspond to an infinite variety of local and historical differences. This program has been constantly expanded by the inclusion of new elements and the assumption of new tasks. Its organization is flexible and coöperative rather than fixed and authoritative. It includes a multitude of public and private organizations which, in spite of occasional disagreements and friction, in the majority of localities have agreed upon methods of coöperation and division of labor. It is free to experiment on any one of scores of fronts without involving an entire national movement in local

failures, while successful experiments are quickly and widely adopted.

Meets Pragmatic Test

"This program meets the practical, pragmatic test—it works. Measured by the statistical test that is applicable to any phase of medical care—that of morbidity and mortality—it has proved to be more efficient in attaining its purposes—to reduce illness and to postpone death—than any of the autocratic and official programs existing in other countries and which are urged for adoption here. The development of this program for the future depends upon the continuance of the same methods, constant investigation and study to discover defects, cautious experimentation with methods to correct those defects and development of such of these experiments as prove sound, practical and serviceable.

Foundation Laid

"This survey not only sought to bring out the facts concerning the need and supply of medical care, but to lay the foundation for whatever changes might be helpful in meeting any deficiency in the supply of medical care. County medical societies were asked to assemble the original forms and to analyse the facts which they revealed. It was suggested that medical societies should also assemble any additional information bearing on the subject of the survey and should then prepare a report, copies of which were to be sent to their respective state medical societies and to the American Medical Association. It was suggested that this report might well form the basis of proposed improvements in the local medical and health programs. Not all of the county medical societies carried out all of the details of this suggestion. A considerable number, however, did prepare such reports, some of them constituting fairly large bound volumes of typewritten or mimeographed material which contained suggestions as to the methods of introducing needed improvements.

Open to Examination

"The state medical societies also were asked to assemble the county society reports and to include a number of items of information applying to the state as a whole. Some of the state medical societies also prepared extensive bound volumes of the information assembled in the course of the study and the societies' recommendations as to future action. Many of the state and county medical society reports state that measures have already been taken to supply some of the deficiencies which the survey revealed. It is already evident that one of the results of the survey will be the introduction of appropriate improvements, some of them of a minor character and others of a more extensive nature requiring changes in the general program of medical care. Furthermore, the material assembled in this survey is available for the development of future programs. This material is open for examination by any public or private body or individual interested in improving the conditions of medical care in this country."

Will They Take Heed?

Now that these invaluable data are available for investigation by everyone interested, one wonders whether the federal authorities will take advantage of the opportunity which has been offered to them by the American Medical Association. Federal health authorities are given an opportunity in this Report to determine health conditions as they actually exist in the various localities, the deficiencies are clearly described and suggestions are made as to how to best correct them. One hesitates to make any prediction, but if government officials run true to form, the chances are that they will pay little or no attention to this invaluable survey.

Copies of the survey report are available to anyone applying to the office of our Association Secretary. Anyone who makes a careful study of its contents will be amply repaid. The Bureau of Medical Economics of the American Medical Association, under the able guidance of Dr. R. G. Leland, deserves the greatest praise for bringing its efforts to such a successful conclusion.

If the survey does nothing else, it brings out in bold relief the value of paragraph No. 5 of the platform of the American Medical Association, which calls for "The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration."—W.F.B.

THE NATIONAL PHYSICIANS' COMMITTEE

Organization of the National Physicians' Committee has gone on apace. Through the energetic efforts of the Executive Administrator, Mr. John M. Pratt, a number of pamphlets have been distributed to all of the physicians of the country, informing them as to the objectives of the Committee, with suggestions as to action which might be taken.

There is no question that the best form of propaganda regarding the activities of the medical profession and its influence on the nation's health today is by word of mouth. In other words, if each physician would take upon himself the duty of informing his patients and friends as to the facts involved, we should accomplish a large part of our objective. There is no form of publicity quite like direct personal propaganda.

It would be advisable for members of the National Committee in each locality to get together

and formulate some program so that they can appear on the program of community or other groups and give them the information that we desire to put across.

If there is any lack of ideas on this subject, information can be gained by a careful perusal of the various pamphlets entitled "The Achilles Heel of American Medicine," "Priceless Heritage" and "The Minute-Men of American Medicine," which have been put in the hands of nearly every physician. The success of this movement is up to every individual member.

If additional material is desired, a discussion of the various portions of the platform of the American Medical Association would be most appropriate and would furnish plenty of campaign material.

FROM THE NATIONAL CONFERENCE ON MEDICAL CARE

Minnesota's conference off-spring, the Northwest Regional Conference, became a full-fledged national meeting in Chicago, Sunday, February 11, and some sixteen Minnesota physicians were among the 225 representatives from twenty-four states who attended.

Group medical care, group hospitalization, public welfare programs, the general tax problem and federal aid to the states in the extension of health programs were chiefly discussed on the program because medical leaders everywhere are pre-occupied with these and related problems.

It is to be hoped that proceedings of the conference will be published in full. In the meantime, the following brief résumé may be of more than passing interest as an indication of the extent and liberalism of medical endeavor today.

Hospital Service Extended

In Missouri, for instance, group hospital service, on much the same pattern as our Minnesota Hospital Service association plan, is being extended to rural districts. Dr. Carl F. Vohs, St. Louis, outlined the service, declared that it was operating successfully in Missouri and said that rural contracts are being sold through Missouri Farm Bureaus.

In New York City group hospital service has had difficulties in the last year or two and is now being re-habilitated. The fault, according to Mr. David H. McA. Pyle of New York, was not in

group hospitalization itself, but in the former policy of selling individual contracts. Many individual contracts had to be canceled to set the plan on its feet again. Hospitals are coöperating to tide the plan over the rehabilitation period.

Michigan—Off to a Start

In Michigan, the new Michigan Medical Service is just getting off to a good start, according to Dr. Henry R. Carstens of Detroit. The service went on sale on January 1, 1940, and no figures are available, yet, to indicate how popular the service will be. It is now being tied up with a state plan for group hospitalization and is already taken on, according to Dr. Carstens, by some one of the biggest of Michigan's big industrial plants.

Farm Security Plans

Dr. R. C. Williams of the United States Public Health Service, reported that no less than 420 county medical societies are now coöperating with the Farm Security Administration to provide medical care for Farm Security clients in many parts of the United States. Details of the plans differ in different localities but all operate on the principle that the client will pay his doctor with money loaned to him by the administration and that the doctor will adjust his charges to the ability of the client to pay.

Choice in Chicago

In Chicago the right of relief clients to their choice of physician has been preserved and protected—in contrast to the situation in many other large cities of the United States, according to Dr. C. H. Phifer. Committees which are, in most respects, comparable to our County Contact Committees pass upon fees, settle differences. Of course, Cook county hospital and other public clinics are used.

Pitfalls

Dr. R. G. Leland warned of several pitfalls that may lie in wait for unwary states which accept Federal funds to set up programs otherwise entirely beyond the ability of the states alone to support. One of them lies in the unreliability of Federal funds which depend upon appropriations from Congress. If Federal funds are withdrawn, it will be up to over-burdened state legislatures to supply the funds.

Relief in Minnesota

Minnesota's re-organized relief program was outlined to the conference by Dr. A. W. Adson,

of Rochester, chairman of the Medical Advisory Committee to the Division of Social Welfare. For many years the handling of medical relief has been more satisfactory in Minnesota than in many other states. A ground-work of coöperation between doctors and welfare officials has been laid which will be utilized to the advantage of both in the official new system of county contact and advisory committees. These committees act in advisory capacity to county welfare boards with the state committee acting in a similar capacity to the state division and also as an appeal body from the county organizations.

The President Listened

President Roosevelt listened carefully to what doctors and hospital representatives had to say at the recent conference on the proposed new hospital building program, Dr. E. H. Cary of Dallas, chairman of the American Medical Association's Legislative Committee reported. This time he incorporated some of their suggestions in his message to Congress and, as a result, the bill introduced by Senator Wagner proposes that hospitals be provided on a basis of local need and not on a basis of matching funds, regardless of local needs. The National Health Program as previously drawn up is not dead, however, in the opinion of Dr. Cary. It may be revived at any time.

"If the Battle Is Lost"

Aid and comfort as well as good advice were to be found in a fine address by Mr. Paul G. Hoffman, president of the Studebaker Corporation. Said Mr. Hoffman:

"Industry faces much the same threat of socialization as medicine and industry, like medicine, must solve its own problems to protect itself from government interference. The tax problem underlies some of our difficulties. Taxes are increasing and must be curtailed before business can recover. We have leaders in Congress who are capable of handling the tax problem if left alone; but they must be given a chance.

"I admit to a fundamental recoil against socialized medicine. Bureaucratic control of medicine would, in my opinion, exert the same deadening influence in your profession that it has in the industrial field. But again, judging solely from what I have read, the problem is there and it has not been fully met. . . . With reduced national income and reduced individual income, in order to maintain automobile volume we had to bring down both the original cost and the upkeep of cars. Many millions of dollars were spent in market research on this problem. . . . I raise the question as to whether

the medical profession has made a similar survey to find out what type of service the average person requires and what he can afford to pay for it. . . . I raise the question as to whether you have applied your fine professional brains to a challenge of every item of the cost of medication, including hospitalization, to make certain that you are giving the customer the best break you can for his dollar. These questions come to my mind because of my confidence that better answers can be found for them by private medicine than by socialized medicine. . . . If there is anything at all to the questions, I urge quick action because, if the battle for freedom is lost on the medical front, our fight to preserve free enterprise in business will be made that much tougher."

Complete Picture

The Connecticut Survey of Needs and Supply of Medical Care is being carried on, not by the medical association, but by the state government. Believing that a survey by physicians would be open to the charge of partiality, Connecticut doctors went to the governor, according to Dr. Creighton Barker of New Haven. Funds were appropriated and a study which it is hoped will give a complete picture of medical care in Connecticut was started. The survey is not yet completed.

Best Method

Many methods of reaching and educating the public were discussed by Dr. Edward J. McCormick of Toledo, but, the best method said Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, by way of comment, is still the direct approach of the physician himself to his patient and friends.

GROUP HOSPITALIZATION IN DULUTH

Seldom has any mutual health scheme taken hold of the Duluth public with such popular approval as has the hospital service plan.

In Canada and the United States four and a half million subscribers, according to figures submitted, are enrolled in non-profit hospital plans. Some groups have had hard sledding. Two states in the union have enrolled over 10 per cent of the population—New York and Minnesota. Forty-two per cent of the population of Duluth is enrolled directly or indirectly and this fact was the principle topic of discussion at the Mid-Winter Conference of Hospital Service Plans held in Pittsburgh in January, 1940.

The Duluth hospitals collected, on account of patients enrolled, \$110,000.00 in 1939. This

amount was spent on about four thousand of the subscribers. The local office contributed its share to the half million reserve carried by the Minnesota Hospital Association. Ninety-eight per cent of these four thousand were in the hospital less than twenty-four days. Women used more of the service than men. The lower income group used the service less than the higher income group; the "whiter the collar" the more it was used.

A rough cross section of opinion among physicians was that their collections were not materially better as a result of the hospital plan. A few found some improvement.

The hospitals on the other hand were filled much of the time in 1939 and patients expressed enthusiasm for the scheme.

The Duluth office expressed its appreciation of the coöperation from local physicians. The average hospital stay in Duluth was less than that in the Twin Cities. To keep the cost to subscribers low means to keep the hospital stay short.—A.N.C.

PLAN TO LOWER COSTS—RAISE STANDARDS

An interesting new development in group health plans is the Group Health Federation of America, Inc., which has just completed its organization, adopted its constitution, by-laws and policies and elected officers.

This federation is composed of "voluntary group health plans in a coast to coast network," to quote a recent bulletin. Among them are the Ross Loos group of Los Angeles, the Group Health Association of Washington, D. C. (storm center of the District of Columbia controversy) and others.

According to its constitution and by-laws the federation aims to promote plans for providing good medical care to people of moderate means at a cost which they can afford and on a basis where they can pay their own way without resort to charity. The organization will "establish and maintain among its members high standards of personal medical care. It will also seek to unify and coördinate the activities of member groups and exchange experiences and information so that each may benefit from the knowledge gained by others.

"—To Complete the Work"

"In essence the Federation hopes, over a period of time, *to complete, in the field of group medicine, the work that has been done by the American Medical Association in raising standards of practice for the individual physician* (italics are ours).

Many names familiar for their association with the earlier promotions of the Foundations or as leaders of individual enterprises which have been much in the news appear among the officers and directors. They include as officers Dr. Mahlon D. Ogden, Trinity Hospital, Little Rock, Arkansas, president; Dr. Michael Shadid, Farmer's Union Coöperative Hospital Association, Elk City, Oklahoma, vice president; Charles A. Marlies, Group Health Association of New York, secretary-treasurer, and Martin W. Brown, assistant secretary. On the Board of Directors are Dr. A. L. Curtin, Milwaukee Medical Center, Milwaukee; Michael M. Davis, Committee on Research in Medical Economics, New York (formerly with the Rosenwald Fund); C. G. Gorman, Group Health Association, Washington, D. C.; Mr. Marlies; Dr. M. D. Ogden, Trinity Hospital, Little Rock, Arkansas; Dr. Elmer Richman, Wage-Earners Health Association, St. Louis, Mo.; Dr. Kingsley Roberts, Bureau of Co-operative Medicine, New York City; Dr. Shadid; Dr. Joseph Still, Greenbelt Health Association, Greenbelt, Maryland; Dr. C. R. Wiley, Civic Medical Center, Chicago.

GROSS MISDEMEANOR

Occasionally, recipients of Old Age Assistance see an opportunity for additional assistance in the allowance made for medical care.

To secure it, all they have to do is to get the doctor to declare they are in regular need of medical service. The doctor is not often a party to such maneuvers but now and again he may yield out of kindness of heart—and ignorance of the fact that he is committing a gross misdemeanor. The law on the matter is explicit. It reads as follows:

Laws of 1937
Section 21

Any person who has obtained or who, by means of a wilfully false statement or representation, or by impersonation, or other fraudulent device, hereafter obtains, or attempts to obtain, or aids or abets any person to obtain:

(a) An old age assistance certificate to which he is not entitled;

(b) More old age assistance than that to which he is justly entitled;

(c) Payment of any forfeited installment grant;

(d) Or who knowingly aids or abets any person buying or disposing of the property of the recipient with the intention to assist in receiving or qualifying any person for old age assistance;

(e) Or any recipient who transfers any personal property exceeding \$300.00 in value without first giving notice to the County Agency of his intention to do so; shall be guilty of a gross misdemeanor.

HOSPITAL REPORT

In view of Senator Wagner's new bill for an emergency appropriation for hospital building, a brief review of the record of hospitals already built with Federal aid in the last six and one-half years should be of interest. These hospitals, it should be noted, do not include any veterans' hospital construction, Federal sanitariums, Indian or military projects or Federal prison infirmaries.

107,849 New Hospital Beds

A recent PWA report on this construction appears in the *Congressional Record* of January 30, 1940:

"During the past six and one-half years the Public Works Administration has made \$176,928,556 in allotments for 743 hospital projects involving the construction of 2,056 buildings providing 107,849 beds. The total construction cost of this portion of the PWA program has been estimated at \$297,253,706. They are located in all the states, the District of Columbia, Alaska, Hawaii and Puerto Rico and approximately 45 per cent of them are located in states that do not contain large metropolitan areas. Many of the hospitals were constructed in communities which heretofore had been without hospital facilities.

Five Years' Growth

"The technical committee appointed at the President's National Health Conference in 1938 determined that the normal increase in hospitals beds has been 25,000 a year. As a result of PWA construction there has been the equivalent of five years' normal growth during the six and one-half years covered.

"PWA-financed non-Federal hospitals are classified into general hospitals, those special hospitals needed in many sections of the country to bring the Nation's hospitals facilities to an adequate standard. The President's technical committee advised that 36,000 beds a year for ten years should be added to the existing supply to adequately meet the demand and in addition the setting up of some 500 health and diagnostic centers in areas now inaccessible to hospitals.

Applications Returned

"This nation-wide need for additional hospital facilities was indicated in the fact that when PWA returned 5,043 applications to public bodies on September 6 because of lack of additional funds there were among them 203 applications for hospitals and institutions with an estimated construction cost of \$105,-486,892."

New Beds in Minnesota

In Minnesota there were 21 hospital projects built providing 42 new buildings and 1,926 additional beds at a cost of \$4,745,377. In Wisconsin there were 18 new hospital projects, providing 40 additional buildings and 1,074 beds at a cost of \$3,925,980. In Iowa, there were 19 projects providing 18 new buildings and 855 beds at a cost of \$1,900,834. The largest number of new hospital beds were provided with PWA aid in Illinois (10,582), in New York (9,721) and in Pennsylvania (8,516).

In addition to this vast amount of civilian hospital construction there have been 152 Federal hospital and sanitarium projects costing \$37,002,863. These projects, including veterans' hospitals and sanitariums, Indian and military hospitals and Federal prison infirmaries, have added an additional 13,911 beds to the nation's hospital capacity, making a total with the non-Federal figure of 121,760 beds.

"WE CAUTION OUR READERS"

For those who were lulled into a false sense of security by the President's birthday message, an editorial which appeared in the last issue of the *Pittsburgh Medical Bulletin* is printed below in full. It is evident that the Wagner bill of 1940 is far from innocuous and the best thought and advice from medical and hospital authorities should be sought before an "experiment" of far reaching consequence is inadvertently fixed upon the statute books.

THE LONG TENTACLES OF BUREAUCRACY

In last week's Bulletin we promised to print in this issue the text of S. 3230, another bill introduced by the Prussian-born Senator Robert F. Wagner of New York. We cautioned our readers at the same time when reading the bill to measure its assertive provisions with their possible distortion through amendment or in subsequent actual administration with the seven guiding points previously proffered President Roosevelt by committees from the American Medical Association and the various national hospital associations.

It will be noted that the bill differs from President Roosevelt's recent message to Congress on the subject of his pet medical service project—the erection by the Federal government of approximately 50 small general hospitals in localities where the need for same has been established and evidence of ability to maintain

them by local funds has been demonstrated. For instance, the bill does not stop with the provision by the current session of Congress for $7\frac{1}{2}$ to 10 million dollars for the construction of such hospitals, but in Section 2 opens wide the "pork barrel" through \$10,000,000 for the year ending June 30, 1941, and for each fiscal year thereafter such sums as the Congress may deem necessary for carrying out the purposes of this act. Also, amounts appropriated under this bill shall be available until expended.

Section 9 opens up an unexpected avenue for the allocation of funds by the President through authorization for the appropriation in each succeeding fiscal year of such amounts as the Congress may deem essential for "the training of personnel deemed necessary" by the Public Health Service for administering the provisions of S. 3230. This at once suggests medical schools definitely under Federal control. In the face of recent commitments by the President of the American Public Health Association and by representatives of the U. S. Public Health Service at the former organization's 1939 meeting in Pittsburgh to the effect that public health activities should now be rapidly broadened with Federal funds in all the states to include more and more of the "curative" phases of medical practice, such angles to any proposed health legislation definitely lengthen the tentacles of bureaucracy.

That our readers may have authoritative bases from which to judge all proposed health legislation in discharging their public duty to discuss such proposals with other intelligent members of the community, i.e., with taxpayers, voters and legislators, we publish again in this issue the recent health legislative platform of the American Medical Association and the seven points governing specifically all proposed new governmental general hospital construction.

Individuals or organizations that see fit to ignore the dangers of advancing the current political philosophy new to the United States "national socialism," should still be cautioned when they engage in discussion of the advisability of seeking new or additional general hospital facilities for a community, a county, or a district, to become acquainted with certain local and fundamental facts: What is the population per square mile in the district? What is the existing general hospital bed capacity, as well as bed occupancy?

Finally, we repeat to our medical readers the caution expressed on page 94 of the Bulletin for February 3, 1940; namely, when new general hospital construction is under consideration, strive consistently, wherever and whenever they are to be located, for competency, free from political domination in expenditures and the professional "staffing" of government-built, locally supported general hospital projects; also, renew your vigilance regarding the future of any medical or social legislation to which the name of Senator Robert F. Wagner is attached, more especially in the face of the recently announced fact that President Roosevelt's Interdepartmental National Health Program Committee, under the chairmanship of Miss Josephine Roche, is "on the loose" again.

"YOUR INSURANCE POLICY"

(Monthly Editorial Prepared by the Medical Advisory Committee)

In a recent communication directed to the chairman of the Medical Advisory Committee was the following paragraph:

My contacts with the doctors the last few years have convinced me that the doctors themselves are their worst enemies and most of them are more or less indifferent to things of their own interest until something happens to affect their pocket book."

How often have you inspected or read your policy of malpractice coverage? Do you know the various provisions in the policies as to the amount involved should you be sued? Is your associate, your assistant or your partner covered by your protection?

These and many other questions could be asked of you, and the likelihood is that the reader would be astounded at his lack of knowledge of the fundamental facts in his policy:

Why not take your policy to the solicitor who wrote it and accepted your premium, or to your lawyer who can explain its provisions to you today, before you are involved in trouble.

In the worry and hustle of medical practice, we are inclined to minimize the possibility of need for adequate protection, but business is business, as many find to their sorrow. Surely, foresight is better than hindsight.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

License of Minneapolis Physician Revoked Following Conviction for Manslaughter

In the Matter of the Revocation of the License of Richard J. C. Brown, M.B.

At the regular meeting of the Minnesota State Board of Medical Examiners held at Saint Paul, on February 9, 1940, the license to practice medicine held by Richard J. C. Brown, Negro physician of Minneapolis, was revoked. Brown was convicted by a jury of the crime of manslaughter in the first degree, in the Court of the Honorable Arthur W. Selover, Judge of the District Court of Hennepin County, on November 22, 1939. Brown was sentenced on November 25, 1939, by Judge Selover to a term of not less than five and not more than twenty years at hard labor in the State Prison at Stillwater. Brown had been indicted by the grand jury of Hennepin County on August 29, 1939, following the death of a 22-year-old Minneapolis girl upon whom it was alleged that a criminal abortion had been performed on July 31, 1939, by Brown.

According to the records of the Minnesota State Board of Medical Examiners, Brown was born at Lincoln, Nebraska, January 17, 1893, and graduated from the University of Minnesota, in 1920, with the degree of Bachelor of Medicine. He was licensed that year by examination.

Minneapolis Physician's License Suspended for Three Years

In the Matter of the Revocation of the License of Donald V. Jordan, M.D.

Donald V. Jordan, M.D., 39 years of age, with an office at 126 Oak Grove, Minneapolis, had his license to practice medicine suspended by the Minnesota State Board of Medical Examiners at its last regular meeting on February 9, 1940. The Medical Board had previously issued a citation requiring Dr. Jordan to show cause on that date, why his license as a physician should not be revoked for aiding and abetting a criminal abortion upon a 19-year-old unmarried Minneapolis girl. The girl was taken ill following the alleged abortion and was hospitalized. However, she recovered her health and subsequently made a statement concerning the case. The hearing before the Minnesota State Board of Medical Examiners disclosed that Dr. Jordan was an excessive user of alcoholic liquors and he was notified by the Medical Board to place himself under treatment for that condition.

According to the records of the Minnesota State Board of Medical Examiners, Dr. Jordan was born in Minneapolis on November 17, 1900, and graduated with the degree of Doctor of Medicine from the University of Illinois, in 1928. He was licensed in Minnesota in 1932, by reciprocity with the State of New York.

MEDICAL AND PUBLIC HEALTH EXHIBITS

The Medical and Public Health exhibits at the New York World's Fair, which were attended by 7,500,000 visitors in 1939, will be reopened for the 1940 season beginning May 11, as announced by Dr. Louis I. Dublin, Acting Chairman of the American Museum of Health.

New exhibits, the nature of which will be made public before the opening date, will be added to the Carrel-Lindbergh "heart," the Transparent Man and other dramatizations of medical science which vied last year with such industrial features as the General Motors Futurama and the American Telephone and Telegraph Company's "Voder" as drawing cards for Fair visitors.

The outstanding value of the Medical and Health exhibits in spreading a knowledge of hygiene among millions of persons is emphasized by Dr. Thomas Parran, Surgeon-General of the United States Public Health Service, in the following letter to Dr. Dublin:

"It is gratifying to learn that the continuation of the Medicine and Public Health Building at the New York World's Fair is assured for 1940 under the direction of the American Museum of Health.

"The unprecedented success of this undertaking last year should give you every confidence that the Museum will continue its high service to mankind.

"The studies of Visitor Reaction in which the Public Health Service cooperated with you clearly show that the exhibit gave to several million people from the United States, Canada and elsewhere, valuable, life-saving knowledge. The unquestioned scientific accuracy of the exhibits and the high grade showmanship under which they were presented were no doubt responsible for the large and enthusiastic audience. I am sure you will have no difficulty in repeating and increasing your marked success of last year.

"With warmest congratulations and best wishes,"

When the 1939 Fair opened, said Dr. Dublin, it was estimated that 3,000,000 persons would view the health exhibits if the Fair's attendance totalled 40,000,000. The number of visitors to these exhibits, however, reached the unprecedented figure of 7,500,000 out of a total Fair attendance of 26,000,000, or approximately one person out of every third visitor attended the Medicine and Public Health Building exhibits.

MISCELLANEOUS

RELIEF FROM STEAMED EYE-GLASSES*

DONALD W. JOHNSON, S.B., M.D.

Fairmont, Minnesota

MOST surgeons who wear glasses are subject to the annoyance of having them clouded by water vapor as the face mask diverts the warm moist breath upward along each side of the nose to condense on the cool surface of the glass, obscuring vision more or less. Various devices have been offered to prevent this very real difficulty, among them impervious masks; metallic inserts; loosely fitting sacs inclosing the whole head. Only more or less successful, these trappings are an added item of expense. They are not always comfortable.

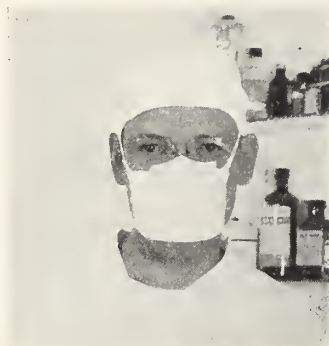


Fig. 1.

Our nurses construct masks from ten thicknesses of 20x12 gauze taped about the perimeter, with the usual four-corner ties of tape. During eighteen years of surgery we have tried all the devices offered to prevent condensation on the glasses, with indifferent satisfaction. The simple expedient of applying a strip of adhesive $\frac{1}{4}$ -inch wide for 3 or 4 inches along the upper edge of the mask and the skin of the nose and face (Fig. 1) has resulted in perfect satisfaction and efficiency. In addition to protecting the glasses from condensation, this arrangement forces exhaled air to filter through the gauze instead of spouting up along the nose, thus increasing protection to the surgical field from air-borne infection. It is also adaptable to every anatomy.

*From the Johnson Hospital.

All behavior is related and it is difficult to distinguish between the behavior which concerns the individual alone and that which concerns others. What a man does about his health, for instance, may concern his family, his business associates, the community and even the entire world.—The Purposes of Education in American Democracy, National Education Policies. Comm., 1938.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR MARCH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

March 2—Rheumatic Fever

March 9—Arthritis

March 16—Gout

March 23—Injuries of Joints

March 30—Exodontia

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The annual meeting of the association will be held at Rochester, Minnesota, April 15, 16 and 17, 1940. Papers on various diseases of the thyroid; dry clinics by visiting guests; and operative clinics by members of the Mayo Clinic staff will occupy the three days of the meeting.

The association is again offering the Van Meter Prize Award for the best essay presented in competition prior to the meeting. The award consists of \$300 and two honorable mentions. Those interested should communicate with Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pennsylvania, not later than March 15, 1940.

THE UNITED STATES PHARMACOPEIAL CONVENTION

In compliance with the provisions of the Constitution and By-Laws of the United States Pharmacopœial Convention, I hereby issue this second call to the several bodies entitled under the Constitution to representation therein to appoint three delegates and three alternates to the Decennial Meeting of the Convention for the Revision of the Pharmacopœia of the United States of America, which is to meet in Washington, D. C., on May 14, 1940.

WALTER A. BASTEDO, M.D.,
*President of the United States
Pharmacopœial Convention.*

February 14, 1940.

NOTICE—In order that the records may be brought up-to-date and checked, that card files may be prepared, and that the other functions of the Committee on Credentials may be performed, it is desirable that the Credentials of all Delegates appointed to attend this Decennial Meeting shall be in the hands of the Secretary, Mr. L. E. Warren, 2 Raymond St., Chevy Chase, Maryland, not later than *March 15, 1940.*

STATE MEETING

Reservations for the Minnesota State Medical Association's 87th Annual Meeting to be held in Rochester April 22, 23, and 24 should be made at once.

Attention of all members has been called to the advisability of making immediate arrangements because the 1940 meeting is more than a month earlier than the customary dates, and now only a little more than a month away.

The meeting is to be held in the fine new Mayo Civic Auditorium and a program of great distinction and interest has been arranged for the three-day session. In addition to the Auditorium meetings, there will be conducted tours to the Mayo Foundation Institute and special physio-therapy demonstrations under the direction of Dr. F. H. Krusen in the Museum building.

Governor Harold E. Stassen will address the annual banquet on Tuesday night, April 23, at the Rochester State Hospital, and the other guest speaker for the occasion will be Mr. Bernard H. Ridder, publisher of the *St. Paul Pioneer Press and Dispatch* who spoke at a recent University of Minnesota convocation on the subject "How the Peace of the World Was Lost."

Another unique feature of the meeting entertainment will be an Open House to be given Monday night, April 22, in the Arena of the Auditorium. The Mayo Clinic and the Olmsted-Houston-Fillmore-Dodge County Medical Society will be hosts for this occasion. There will be a floor show and buffet supper. All visiting physicians and their wives are invited to attend.

Monday's scientific sessions, scientific cinema, and round table luncheons will be conducted exclusively by members of the Mayo Clinic staff. Tuesday and Wednesday sessions will be conducted by other Minnesota physicians and a half dozen famous guest physicians among whom are Dr. Norman Jolliffe of New York City; Dr. Harry E. Mock and Dr. Paul B. Magnuson of Chicago; Dr. John O. Bower of Philadelphia, and Dr. Bernard H. Nichols of Cleveland. The latter will deliver the Russell D. Carman Lectureship annually provided by the Minnesota Radiological Society.

Round-table discussion luncheons on Tuesday and Wednesday will be conducted by Minnesota medical leaders and the guest speakers.

Three-quarters of an hour will be devoted during each morning and afternoon program session to scientific and technical exhibits and the scientific cinema. The Southern Minnesota Medical Society will present its annual medal for the best scientific exhibit submitted by an individual physician at this meeting.

WASHINGTON COUNTY

The regular monthly meeting of the Washington County Medical Society was held on the evening of February 13 at the Stillwater Club rooms.

Royal C. Gray, M.D., psychiatrist to the state institutions, gave a well prepared paper on "The incidents in childhood of psychosis and schizophrenia." The doc-

tor answered numerous questions afterward. E. M. Jones, M.D., Counselor for the Fifth (our) District of the Minnesota Medical Association, was present by request to advise us on some peculiar membership matters that have developed during the last year. The doctor also spoke of the importance of the Officers' Meeting at the St. Paul Hotel on Feb. 24. This meeting will be very important as new ideas and methods in the conducting of county welfare matters, as affected by new rulings, will be discussed by well-posted men from Minnesota and from other states, especially by Dr. Leland of Chicago. Several announcements were made. A letter from Stillwater Post No. 48, American Legion, was read. It requested, in behalf of the Legion, information in regard to blood donors and conveyed an invitation to members of the Society to their March 5 meeting at the Stillwater Armory. The object is to form a blood donor group at the Post here, certainly a very thoughtful and laudable act, which is heartily recommended by this Society. A committee was appointed to meet with them.

E. SYDNEY BOLEYN, M.D., *Secretary*

Dilantin Sodium

The Council on Pharmacy and Chemistry reports that sodium 5,5-diphenyl hydantoinate, originally presented under the name Dilantin, had been redesignated "Dilantin Sodium" and is now marketed by Parke, Davis & Co. as "Kapseals Dilantin Sodium." Dilantin Sodium is an active anticonvulsant and relatively feeble hypnotic, used in the treatment of epilepsy. While the clinical studies of H. H. Merritt and Trace J. Putnam, and of O. P. Kimball, pointed to the therapeutic value of the drug the Council requested additional information. Pharmacologic studies were conducted in the laboratories of Parke, Davis and Company, and clinical investigations were made in a number of institutions, five of them in institutions for the treatment of epilepsy and kindred conditions. The pharmacologic studies show that Dilantin Sodium is of relatively low toxicity when administered orally to rats, rabbits and dogs, and much more toxic when injected intravenously. The side actions reported by one or more of the investigators include dizziness, dry skin, dermatitis, rash, itching, tremors, fever, nausea, vomiting, blurred vision, fatigue, apathy, difficult breathing and swallowing, nervousness, mental confusion and active hallucinations. The Council voted to accept Dilantin Sodium for inclusion in New and Non-official Remedies following receipt of an agreement from Parke, Davis & Co. that it would market the product under rigid restrictions, including those which further experience shall indicate, as well as the following: (a) It shall not be recommended for use by the general practitioner unless he is able to maintain a close (daily) supervision of the patient, until the scope of its usefulness as well as its side actions have been determined more accurately; (b) it is not to be recommended for the treatment of those patients whose seizures occur only at long intervals unless moderate doses of phenobarbital are ineffective or induce disagreeable side actions. The A.M.A. Chemical Laboratory has found the composition of Dilantin Sodium satisfactory. (J.A.M.A., Nov. 4, 1939, p. 1734.)

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

The mid-winter meeting of the State board of the Women's Auxiliary of the Minnesota State Medical Association was held in the Radisson Hotel, Minneapolis, January 23. The president, Mrs. A. C. Baker of Fergus Falls, presided at the business meeting at 10 a. m. Reports from the officers, county presidents and chairmen of various committees were heard and much time was devoted to discussions pertaining to *Hygeia* and Public Health activities throughout the state. A very interesting report was given by Mrs. Baker on the recent meeting of the national board held in Chicago. The following women were elected to positions on the nominating committee: Mrs. Thomas O. Young of Duluth, Mrs. Harry Ghent of Saint Paul, Mrs. George B. Eusterman of Rochester, Mrs. E. S. Mariette of Minneapolis, and Mrs. T. N. Fleming of St. Cloud. Luncheon followed the meeting and Dr. E. L. Meyer of Minneapolis entertained the group with motion pictures which he took on a recent trip to South America. Dr. B. S. Adams of Hibbing was the guest speaker. The meeting was very well attended and the following women attended: Mrs. A. C. Baker, Fergus Falls; Mrs. James Blake, Hopkins; Mrs. Sydney Boleyn, Stillwater; Mrs. T. J. Catlin, Buffalo; Mrs. J. A. Cosgriff, Olivia; Mrs. R. R. Cranmer, Minneapolis; Mrs. L. J. Dack, St. Paul; Mrs. N. S. Dungay, Northfield; Mrs. F. Elias, Duluth; Mrs. E. C. Eshelby, Saint Paul; Mrs. George Eusterman, Rochester; Mrs. T. N. Fleming, St. Cloud; Mrs. Harry Ghent, Saint Paul; Mrs. J. B. Gaida, St. Cloud; Mrs. E. V. Goltz, Saint Paul; Mrs. G. Haight, Detroit Lakes; Mrs. E. M. Hammes, Saint Paul; Mrs. L. P. Howell, Rochester; Mrs. R. J. Josewski, Stillwater; Mrs. O. O. Larson, Detroit Lakes; Mrs. Ernest Mariette, Minneapolis; Mrs. McGath, Rochester; Mrs. Martin Nordland, Minneapolis; Mrs. J. F. Norman, Crookston; Mrs. W. B. Roberts, Minneapolis; Mrs. J. J. Ryan, Saint Paul; Mrs. Theo. Sattermann, Pelican Rapids; Mrs. J. A. Thabes, Sr., Brainerd; Mrs. W. W. Will, Bertha; Mrs. T. O. Young, Duluth; Mrs. H. F. Wahlquist, Minneapolis.

The eighteenth annual convention of the Women's Auxiliary of the American Medical Association will be held in New York City, June 10-14, 1940, with headquarters in the Hotel Pennsylvania. In view of the fact that the second edition of the World's Fair will accelerate advance hotel reservations, it is urged that reservations be made immediately through the Housing Bureau which has been set up by the American Medical Association, namely Dr. Peter Irving, Room 1036, 233 Broadway, New York City, N. Y.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of January 10, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 10, 1940. Dinner was served at 7 o'clock and the meeting was called to order by the President, Dr. James A. Johnson, at 8:15 p. m.

There were fifty-three members and one guest present.

Minutes of the December meeting were read and approved.

The secretary read a letter from Dr. Herbert Davis, of Saint Paul, asking that his name be transferred from the Active to the Senior membership list. This had been approved by the Executive Committee. Upon vote, this transfer was accepted.

The following Memorial to Drs. William J. and Charles H. Mayo was read by Dr. S. Marx White. A motion was carried that this be accepted, spread on the minutes and a copy sent to each family.

THE MAYO BROTHERS

Dr. William James Mayo, born at Le Sueur, Minnesota, June 29, 1861. Died July 28, 1939.
Dr. Charles Horace Mayo, born at Rochester, Minnesota, July 12, 1865. Died May 26, 1939.

To those who knew them best, as did their medical and surgical friends and neighbors in Minnesota, the fact that the elder brother, Doctor Will, was called by death just nine weeks after the loss of his brother, Doctor Charlie, seems almost a corollary of their useful and devoted lives together. During the later years of their father, Dr. William W. Mayo, they delighted to honor him, and with his death that generous spirit continued between them. When opportunity or honor came to one, he saw to it that it was shared by the other.

It is not the intention in this brief memoir to list the honors or recite the achievements of these two outstanding leaders in medicine and surgery. Their fame was national and soon became world-wide. Details concerning the life of each may be found in the July and August, 1939, issues of MINNESOTA MEDICINE, as well as in many other professional and lay publications immediately following the death of each.

To the members of the Minnesota Academy of Medicine the dates of their inaugural theses read before this body and the titles of subsequent contributions to our programs may be of interest.

Doctor Will's thesis entitled "A Discussion of Some Features of Peri-uterine and Peri-typhlitic Abscesses" was read at the meeting of May 3, 1890, and published in *Northwestern Lancet*, Volume X, page 166. From then on he presented papers on various subjects—Cancer and Its Surgical Treatment, Extra-uterine Pregnancy, Cicatricial Stenosis of the Esophagus and Its Surgical Treatment, Diagnosis of Surgical Diseases of

the Kidney, Surgical Treatment of Suppuration, Preliminary Examination of the Surgical Patient, Diagnosis and Surgical Treatment of Certain Diseases of the Stomach, Primary Tuberculosis of the Intestine, Surgical Treatment of Some Benign Affections of the Stomach, Malignant Disease of the Gallbladder and Bile Ducts, Cancer of the Rectum. His last paper presented at an Academy meeting was on Splenic Anemia, read at the meeting of May 21, 1919.

Doctor Charlie's inaugural thesis on "Skin Grafting" was presented at the meeting of March 1, 1893, and published in *Northwestern Lancet*, Volume XIII, page 148. Subsequently papers were read on Brain Lesions the Result of Injury without Apparent Fracture, The Use of Heat in Surgery, and on Prostatectomy. The last paper of record was read on Uterine Prolapse at the meeting of April 1, 1914.

The names of both brothers have been on the list of honorary members of the Academy for many years.

Striking evidence of their organizing and professional genius may be found in the fact that they converted what would have been to most men a handicap, into an advantage unprecedented in the history of medicine. If they had done their work in a great medical center, their abilities would no doubt have been the same, but the performance could not have been so unique. Working in a rural community, these two men wrote their names as masters in their field on the roll which contained such names as Keen, Halstead, Fenger, Murphy and a long list of others of like quality, teachers and leaders in American surgery.

The late Dr. A. J. Ochsner of Chicago has told how in the earlier days he with Will or Charlie, one of the brothers at a time, went to see the work of this or that surgeon who had published some new method or tried some new type of operation, first in this country and later abroad. Learning with avidity it was not long before they themselves were in position to teach. Their lives exemplified one of the glories of medicine handed down from the days of Hippocrates in that he who learns shall pass on freely all he knows to all who seek to know. Learning from anywhere in the world where knowledge was to be found, they passed it freely on. Their teaching was personal, direct and practical. Not only did they give freely to all who visited them in Rochester, but the organizing genius built around their clinic a great center for postgraduate instruction. Untrammelled by tradition and free from control of any kind—governmental or educational—their quasi-isolation and freedom from restraint fostered a following and an audience limited only by the capacity of the physical plant and their personal endurance. With great foresight they sought to perpetuate the values of their situation. The history of medicine in the future must recognize their place in the establishment of coördinated, group effort and in furthering graduate teaching and research in medicine. Dr. William Mayo's long service as Regent of our University gave him an insight into

the needs and the technic of education. The Mayo Foundation coördinated with graduate teaching and research in the Medical School of the University of Minnesota has, as its objective, increase in and dissemination of knowledge in medicine and surgery. The desire of the founders is to return to the people by means of improvement in medicine and surgery that which the people have given the founders.

Many stories and incidents have been current illustrating the differing characteristics of their personalities. They were strong, striking and vigorous, and together they made a real contribution to their times. History has a place for them.

Certain incidents seemed at the time to be of little significance. The importance of these grows in retrospect. Their two operating rooms were side by side before other surgeons came into the group. Visitors then will recall incidents such as follow. Will, in his room, operating let us say on the thyroid or the prostate of a patient, would comment on the superior skill of Charlie in operations in the region, and invite the guests to take the first opportunity to observe his brother at this work. Or Charlie, in his room, operating in the abdomen, would deprecate his own skill, and invite his listeners to study what he truly believed to be the most skillful surgeon in this field, brother Will. The effect was electric. Their belief was genuine, and because they possessed it, it came alive and to be accepted.

These two men with brotherly devotion have lived and taught a lesson which all of us in medicine may learn. Working together with high purpose and for each other and for their common good, their efficiency and performance increased not in arithmetical but in geometrical progression. It was as if together they made not two but four. We may learn that working together and not for ourselves alone, the good and the reputation of each will be enhanced.

Dr. Carl B. Drake, Saint Paul, retiring president, read the following Presidential Address. Lantern slides were shown.

SOME APPLICATIONS OF HYDRODYNAMICS TO THE CIRCULATION*

CARL B. DRAKE, M.D.
Saint Paul, Minnesota

Hydrodynamics is that branch of hydraulics which deals with liquids in motion. As applied to the circulation it is termed hemodynamics and involves a consideration of both physics and physiology. A clinician cannot be expected to delve very deeply into either of these allied sciences but may be pardoned for attempting to present some of the simpler laws of hydrodynamics and their application to clinical problems.

It should be understood that the conditions met in the circulation of the blood are comparable but by no

means identical to the flow of water in pipes. In the circulation we have a pump acting at a variable rate and ejecting fluid into a closed system of elastic pipes of various and varying caliber. The circulatory system is supplied by a complicated nervous mechanism which regulates the heart rate and the caliber of the vessels according to the needs of the organism. The heart too has a marvelous ability to dilate and hypertrophy when there is need for greater output or force.

To consider a few facts concerning the behavior of liquids at rest and in motion:

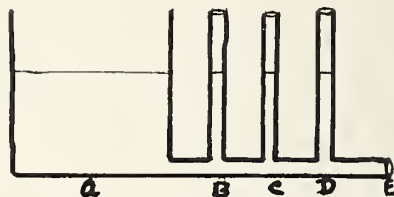


Fig. 1.

Figure 1 represents a tank, *A*, with a horizontal outlet pipe which is closed at *E*. Inserted vertically to the horizontal pipe are a series of tubes *B*, *C* and *D* known as piezometer tubes. Fluid levels in tank and tubes are the same and the side or lateral pressures over equal areas of surface at *A*, *B*, *C* and *D* are equal and are measured by the height of the columns of fluid in the tank and piezometer tubes. Thus fluid possesses potential energy due to its elevation and at areas *A*, *B*, *C* and *D* is measured by the height of the fluid irrespective of the quantity of fluid in the tubes or tank.

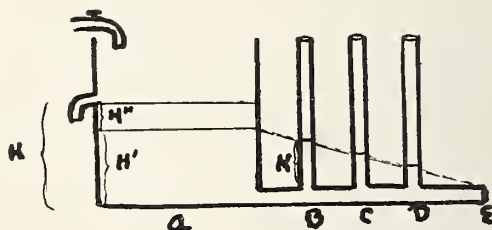


Fig. 2. From Gladstone.

In Figure 2, the outlet at *E* is open and the fluid level in the tank is maintained at a constant height *H*, by water from a faucet and an overflow. Water will flow from the outlet *E* at a certain rate and will possess a certain kinetic energy due to its velocity. The potential energy possessed by the fluid in tank *A* has therefore been converted into kinetic energy. Not all, however. A certain amount has been used to overcome resistance due to friction in the flow of the water in the horizontal tube. The amount of potential energy used to overcome friction is represented by the height *H'* and the remaining height *H''* represents the potential energy converted into kinetic energy at *E*.

The fluid levels in tubes *B*, *C* and *D* are successively lower than the level in *A* and represent the side pressures at *B*, *C* and *D*. Since the velocity in the hori-

*Presidential address before the Minnesota Academy of Medicine, January 10, 1940.

zontal tube is the same at *B*, *C* and *D* the loss of pressure in tube *B*, for instance, is due to the pressure required in overcoming friction from *A* to *B*, and the height in tube *B* represents the pressure necessary to overcome the frictional resistance from *B* to *E*. The blood vessels which leave the aorta do so at right angles and thus serve as piezometer tubes. Thus the pressure in the brachial arteries represents approximately the pressure in the aorta and is not directly affected by changes in velocity head in the aorta.

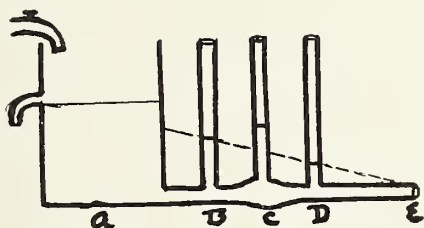


Fig. 3. From Best and Taylor.

The pressure head remaining constant, the velocity of fluid passing through a tube is inversely proportional to the cross section (sectional area) of the tube.² Thus in Figure 3 the velocity of the liquid at *C* is less than at *B* or *D*. Lateral pressure is inversely proportional to the velocity. Thus the fluid level in tube *C* is higher than in tube *B*, indicating a higher lateral pressure at *C*. The velocity however at *D* is the same as at *A*. Thus in an aneurysm of the aorta the velocity in the dilated portion is less and the lateral pressure greater. The greater pressure tends to further dilate the weakened wall of the aneurysm with further slowing of velocity and increase of pressure, a vicious circle.

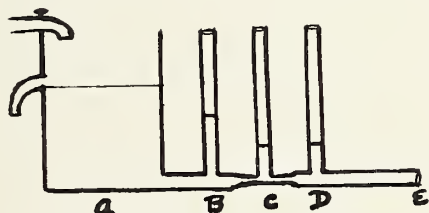


Fig. 4. From Best and Taylor.



Fig. 5. From Howell.

According to the same laws the velocity in the narrowed tube at *C*, Figure 4, is increased and the lateral pressure is less as shown by the lower fluid level in tube *C*.

In Figure 5 a tap partially narrows the lumen of the tube at *X*. This results in a sharp lowering of the lateral pressure in tubes *F* and *G* beyond the narrowing.² This is the situation in coarctation of the aorta, in which condition the pressure beyond the narrowing, including that in the legs, is markedly diminished. The heart compensates by increasing the pressure above normal, proximal to the coarctation, and hypertension is found in the brachials.

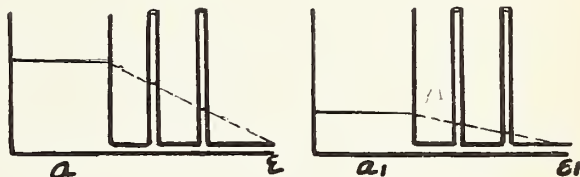


Fig. 6.

The cross section of a tube remaining constant, the velocity of the fluid in the tube is proportional to the pressure gradient. Thus in Figure 6 the higher pressure in *A*, than in *A1*, results in a greater velocity at *E*, than in *E1*. In hypertension the pressure is increased because the arterioles are narrowed. The velocity in the arterioles must be increased if the heart output is unaltered. Weiss found the average cardiac output in hypertension within normal limits.

Friction offers resistance to the flow of liquid through a tube and this friction varies with the surface area encountered by the liquid. At low velocities this frictional resistance is very little. At moderate velocities the frictional resistance varies as the velocity of the fluid while at high velocities it varies as some power of the velocity. This friction occurs not solely at the contact of the fluid with the sides of the tube² for it has been found that fluid does not flow through a tube as a column, and every portion of the fluid does not flow at the same velocity. Instead there is a layer of fluid next to the tube which moves slowly, while successive layers of fluid towards the center move more and more and the greatest velocity occurs in the center of the tube. Friction occurs for the most part between these peripheral layers of fluid. For this reason the frictional resistance is probably not greatly increased in atheromatous vessels.

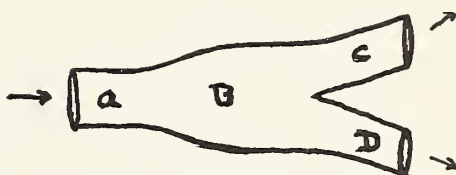


Fig. 7. From Gladstone.

Figure 7 shows fluid passing from *A* to *B* and to *C* and *D*, all of which areas are assumed to lie in the same horizontal plane to eliminate the effect of hydrostatic pressure. The cross section at *B* being greater than at *A* the velocity of the stream at *B* is less and the lateral pressure greater than at *A*. The sum of the

cross section at *C* and *D* being greater than at *B*, likewise the velocity at *C* and *D* is decreased from that at *B* and the lateral pressure tends to be increased. However, as fluid flows through tubes its lateral pressure head tends to decrease because of frictional resistance, and this resistance varies with the length of the tube, i.e., is proportional to the frictional surface encountered. The frictional surface per unit of length in tubes *C* and *D* is much greater than the frictional surface at *B* so that the friction effect of the greater surface on the pressure more than counterbalances the increase in pressure in *C* and *D* due to diminished velocity and results in an actual decrease in pressure at *C* and *D*.

Thus in circulation of the blood as arteries leave the aorta the cross section of the arterial field is increased, which tends to lower the blood velocity in the middle sized vessels and increase the blood pressure; but the increased frictional surface encountered in the middle sized arteries results in an actual lowering of the blood pressure.

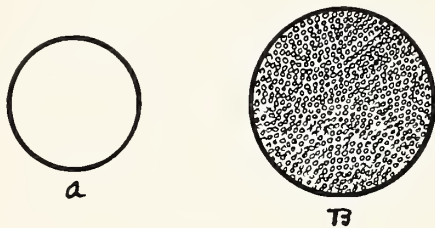


Fig. 8.

Figure 8, *A*, represents a cross section of the aorta and *B* the sum of the cross sections of the arterioles somewhat larger than *A*. Although the cross sectional area of the blood stream in the arterioles is greater than that of the aorta, the sum total of surface areas of the arterioles is much greater than that of the aorta, which results in a greatly increased frictional resistance. We know that the frictional resistance is proportional to the surface area in contact with the stream. While the cross sectional area of the capillaries is 600 to 800 times that of the aorta and the sum total of the surface area of the capillaries affording frictional resistance is enormously increased, on the other hand the great increase in the bed of the blood stream results in a marked slowing of the blood flow (to 1 mm. per second) and in the presence of such a slow velocity friction is relatively slight.

Both right and left ventricles eject blood by a shortening of the muscles, which decreases the size of the ventricles, thus forcing the blood into the pulmonary artery and the aorta. Their stroke volumes are equal and also of course their minute volumes (the blood ejected in a minute). The left ventricle propels blood into the aorta during systole, and the aorta is distended and its elasticity maintains arterial pressure during diastole. No diastolic pressure could be maintained in the arterial system were it not for peripheral resistance. This is supplied largely by the arterioles.

Assuming the muscular contraction of the ventricles to be isotonic, that is, that the rate of contraction is

the same throughout systole and that the ventricular cavity were the shape of a sphere and emptied completely during systole, much more blood would be expelled during early systole than during late systole.¹¹

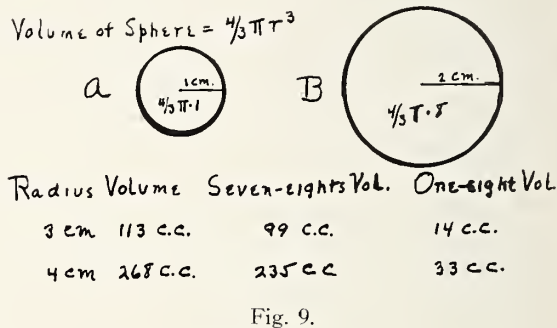


Figure 9 represents two spheres with radii of 1 and 2 cms., respectively. The volume of a sphere is $\frac{4}{3}\pi r^3$. The volume of sphere *A* with a radius of 1 cm. is $\frac{4}{3}\pi \times 1$, or about 4 c.c. A sphere with a radius of 2 cm. is $\frac{4}{3}\pi \times 8$, or about 32 c.c. Thus a sphere with twice the radius of another has a volume eight times as great. Thus if the ventricle were a sphere it would expel seven times as much blood during the first half of systole as during the last half, while its radius was being reduced by half, providing it completely emptied with each contraction. It seems warranted to assume that the heart expels at least seven-eighths of its content during the first half of systole. This relationship of eight times the volume in a sphere with twice the radius applies no matter what the size of the sphere and in cardiac dilation seven-eighths of the ventricular content may be a considerable volume of blood.

The great amount of blood ejected from the ventricle during the first part of systole largely distends the aorta and raises the intra-aortic pressure from its diastolic to its systolic level. This results because more blood enters the arterial system during this time than leaves through the capillaries. Much less blood being expelled by the ventricle during the latter half of systole and at a lesser rate than the blood leaves the arterial system, the intra-aortic pressure in late systole drops.



Fig. 10. Modified from Wiggers.

Pressure curves in the ventricle and subclavian artery (or aorta) are shown arranged synchronously in Figure 10, *A*.¹¹ As the ventricle begins to contract, the

intraventricular pressure rises to the point *b*, during which its contraction is isometric, that is, no actual shortening of the muscle fibers of the heart has occurred. As the intraventricular pressure arises above the diastolic pressure in the aorta, the pressure within the aorta begins to rise (1-4). The high point of pressure in both ventricle and aorta is reached at about mid-systole and both pressure curves descend during the latter part of systole. The aortic valve closes at 6, indicated by the dicrotic notch, when the intraventricular pressure *c* is only moderately higher than it was at the beginning of systole *b*. The result of this lower intra-aortic pressure at the end of systole is sparing to the aortic cusps.

As was stated, the blood pressure in the systemic circulation decreases progressively towards the periphery. In the aorta it varies between systolic and diastolic values. In the medium sized vessels² the mean pressure is about 20 mm. Hg. less than in the aorta and it falls some 50 to 60 mm. in the arterioles. In the capillaries it has been estimated at about 20 mm. Hg. and it falls progressively in the veins to about 5 mm. of water in the vena cava. The difference between diastolic and systolic pressures gradually becomes less as the periphery is approached and disappears in the capillaries and veins. The venous pressure in the upper portion of the body reaches zero in the lower jugular veins, beyond which it is negative, being -35 to -80 mm. of water at the right auricle during relaxation of the auricles.

Several factors assist the return of the blood through the veins to the right heart. Respiration is one. In the pleural space there is a negative pressure of about -6 mm. during inspiration which becomes about -2.5 mm. Hg. during expiration.² This negative pressure within the thorax is exerted on the vena cava and added to the slight positive pressure within the large veins produces return blood flow to the right auricle. The contraction of the diaphragm increases intra-abdominal pressure, which in turn exerts pressure on the inferior vena cava. The presence of valves in the inferior vena cava and in the iliac veins prevents the blood from returning to the periphery and thus periodic abdominal pressure assists in blood return to the right auricle. Muscular action in the lower extremities also aids venous flow in the extremities. The assistance to flow rendered by these several factors is greatly increased during exercise.

Variations in intrathoracic pressure affect the circulation. With the glottis and respiratory track open there is a negative pressure in the thoracic cavity during both inspiration and expiration due to the elasticity of the lungs. With the glottis closed, however, forced expiration (a grunt) may increase the intrathoracic pressure to 60 or 100 mm. Hg., which overcomes the negative pressure in the pleural space, and being much greater than the pressure in the inferior and superior vena cava, may prevent filling of the right auricle. If maintained long enough, it may produce syncope. This effect on venous pressure is evident if one watches an infant at stool. Its face becomes suffused with blood and the vessels in the neck become distended. On the other hand, forced inspiration with the glottis closed

causes a marked increase of 30 to 80 mm. Hg. in the negative pressure in the thorax. In asthma the assistance rendered return circulation by forced inspiration should about counteract the interference afforded by forced expiration. Perhaps this explains the absence of evidence of cardiac strain in many of these cases.

The velocity of the blood flow varies greatly in different regions of the circulatory field. It is greatest in the aorta during early systole, while it is zero at the root of the aorta during diastole. We have mentioned that as arteries branch off the aorta the blood bed is increased, which tends to reduce velocity. The bed of the stream is so large in the capillaries that the velocity there is minimal. Such a slow flow in the capillaries facilitates exchange between blood and tissues. In the veins the velocity increases as the heart is approached, being greatest in the superior and inferior venæ cavæ, although the velocity here is not as great as in the aorta as the combined cross sections of these large veins is greater than that of the aorta. The circulation time from right jugular to left jugular, which represents the shortest course from right jugular to right heart, lungs, left heart, head and left jugular has been determined to be twenty-three seconds.

A number of tests for determining the velocity of blood flow have been proposed for clinical use.¹ Five minims each of ether and normal saline are injected into the median basilic vein and the time it takes for the odor of ether to be noticeable to patient or observer is recorded. This measures the velocity of the blood stream from the vein to the lung. The time period varies in normals but four to eight seconds may be taken as the normal figure, an increase in this time indicating right heart failure. Similarly the velocity of the circulation from the median basilic vein to the tongue is determined by the injection of different substances. Saccharine produces a sweet taste, decholin a bitter taste, and calcium gluconate a sensation of heat in the throat. The time in normals is about eight to sixteen seconds and lengthening of the time indicates slowing of the circulation between these two points, due to a weak left ventricle or both left and right ventricles. The difference between the vein to tongue and the vein to lungs times would indicate the time taken from lungs to tongue and an increase above the normal would indicate an impaired left ventricle alone. Nausea and vomiting sometimes accompany the decholin test and an appreciable percentage of all the tests is accompanied by thrombosis of the vein. It is likely, however, that these tests are of value in certain cases.

The blood pressure in the pulmonary circulation is normally about 40 systolic and 12 diastolic, with a mean pressure of about 20 mm. Hg. Although the right ventricle pumps the same amount of blood as the left ventricle during the same period of time, its work is only about one-third that of the left, as most of the work of the ventricles is in overcoming resistance. The right ventricle has need therefore of a less powerful muscle.

Certain factors affecting the blood pressure in the popliteal artery are worth considering. Figure 11, *A*, shows a tube of uniform caliber through which fluid is

flowing at a uniform rate and tubes of smaller uniform caliber 1, 2 and 3 tapping the tube at different angles. Tube 2 is a piezometer tube and the pressure as indicated by the fluid level is unaffected by the velocity in the main tube. The fluid level in tube 1, however, is lower than in tube 2 and the level in tube 3 is higher than in tube 2, pressure due to velocity head being subtracted in tube 1 and added in tube 3 to the lateral pressures. Figure 11, *B*, shows schematically the vessels leaving the arch of the aorta at right angles and the bifurcation of the aorta into right and left iliacs. The angles at which the iliac arteries leave the aorta explain the higher blood pressure in them and in the popliteals than in the aorta and brachials even in the horizontal position. Pressure due to velocity is added to the lateral pressure in the popliteals.

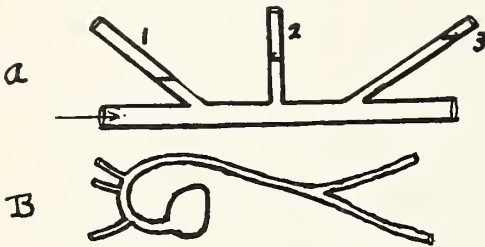


Fig. 11.

Hydrostatic factors have little effect on the circulation when the individual is in the horizontal position. In the erect position, however, it aids arterial flow in the lower extremities, increasing blood pressure in the popliteals. In this position it hinders return flow from the lower extremities to the heart to the extent of the pressure of a column of blood of about three and a half feet (77 mm. Hg.); in the upper extremities it assists arterial flow but hinders venous flow and in the head its action is the opposite. In one patient with normal circulation, the brachial blood pressure was 135-85 and that in the leg 168-108, both taken in the recumbent position. On standing, the blood pressure reading in the leg was 200-160.

The greater the viscosity of a fluid the greater the friction encountered in passing through tubes. Blood is five times as viscous as water and its viscosity is increased in polycythemia, leukemia and anhydremia. This increase, however, does not cause any significant deviation from normal in the circulation.

The total blood in circulation amounts to about five or six liters. In addition to the circulating blood there is an appreciable amount of blood lying passive or moving very slowly in the spleen, liver and so-called subcapillary spaces which is mobilized under certain conditions, such as during exercise and after eating.¹²

There is no uniformity of opinion as to the amount of blood pumped by each ventricle at each contraction (stroke volume) or as to the amount pumped in a minute (minute volume). Some³¹ state the stroke volume at rest is 50 to 60 c.c. This would amount to a minute volume of about 4,000 c.c. Some writers estimate that the heart is capable of varying its amplitude

of stroke, from three to ten fold. Henderson,¹³ on the contrary, states that, "Convincing evidence from a wide range of sources indicates that in vigorous men and other mammals of all sizes the stroke volume of the heart is a nearly constant quantity for each individual. Both during rest and work it is of the order of magnitude 1.5 to 2 c.c. per kilo body weight." According to this view the stroke volume would be 105 to 140 c.c. for a 154-pound man and 150 to 200 c.c. for a 220-pound man. According to these figures the minute output for a 154-pound man would vary from 7,350 to 9,800 c.c. at a pulse rate of seventy and from 10,500 to 14,000 for a 220-pound man with the same pulse rate of seventy.

During exercise³¹ the systolic blood pressure may be elevated to 160 or 180 mm. Hg. and the diastolic to about 120. The heart rate also increases during exercise, more in those accustomed to sedentary life than in athletes. A doubling of the heart rate would result in twice the heart output, providing the ventricle filled as completely during exercise as at rest. If the stroke volume is increased during exercise a doubling of the heart rate will more than double the minute volume. Best and Taylor state that the minute volume may increase from 9 to 37 liters during exercise. This cannot result from an increase in heart rate alone and presupposes a greater stroke volume during exercise. The duration of systole changes very little with increase of heart rate, but most of the rate increase is at the expense of diastole. Wiggers³¹ has shown that the minute volume increases proportionately with heart rate up to 60 to 78 per minute. With rates of 78 to 210, the minute volume steadily increases but not proportionately with the heart beat. This means that the stroke volume in rates from 78 to 210 is less than at rates below 78 and is contrary to the idea that the ventricle dilates during exercise. Beyond the rate of 210 the minute volume shows a decrease, as the ventricle does not have sufficient time during diastole to fill well. This occurs in paroxysmal tachycardia, a case having been reported in which the stroke volume was reduced from 70 to 12 c.c. Such a marked diminution in blood supply if prolonged may be serious. One case has come to my attention in which a heart rate of about 266 lasting two or three days in a six-months old infant was followed by a serious deafness, presumably due to prolonged undernutrition to the delicate auditory nerve fibers. In another case of a forty-three-year-old physician death occurred in about twelve hours from an attack of paroxysmal tachycardia because he insisted on actively caring for his patients.

It seems certain that the capacity of the ventricle varies in different normal individuals. The trained athlete doubtless has a larger ventricular capacity and a greater musculature than one unused to exercise. The minute volume is certainly increased greatly during exercise but probably not because of any greatly increased stroke volume. Certainly x-ray examination of hearts during exercise fail to indicate increase in diastolic volume. We have noted the marked effect increased rate and depth of respiration and muscular action in the lower extremities have in increasing the return flow

of blood to right heart. This results in a better supply of blood to the right heart and more rapid filling during diastole.

The term work is used in a special sense in physics. A man leaning against a wall to keep it from falling is not expending energy in work as the term is used in physics. Work in physics is the product of force expended by the distance it acts. The work of the heart is the force required to move a certain amount of blood times the distance moved and the work required to give the blood a certain velocity. It has been determined that the energy of the heart used in giving velocity to the blood amounts to less than one per cent of the total work of the heart. Therefore the velocity factor of the heart's work may be ignored in calculating roughly the work done. The force exerted by the heart at each stroke is the same as the peripheral resistance overcome. The heart expelling 100 c.c. of blood at each stroke through a tube 3 cm. in diameter will propel it 14 cm. The mean resistance encountered in the aorta is 97 mm. Hg or 132 cm. of water. If the heart were connected with a tube of water it would therefore at each contraction lift a column of water 132 cm. high and 7 sq. cm. in cross section a height of 14 cm. Such a column of water weighs 924 grams. Thus at each stroke the heart does about 13,000 gram-centimeters of .13 kg. meters of work. Each minute the work of the heart would be $.13 \times 80$ (pulse rate) or about 10 kg. meters. This is the equivalent of raising 10 liters of water 1 meter each minute. This applies to the left ventricle alone and as the work of the right heart is about a third of that of the left, the total work of the heart would be roughly raising 13 liters of water one meter each minute, the individual being at rest.

The caliber of the arteries is subject to variations and is controlled by the sympathetic nervous system. There is probably a vasodilator center as well as a vasoconstrictor center. With constant pressure head the velocity head is proportional to the sectional area of the tube but the quantity of fluid passing through the tube per unit of time (the volume flow) is proportional to the forth power of the diameter of the tube (Poiseuille's law). Slight changes in the caliber of the peripheral arteries therefore produce great variations in the volume of the blood flow. In addition to the vasodilator and the vasoconstrictor centers the carotid sinus doubtless plays an important part in regulating blood pressure and blood supply. Increase of blood pressure in the carotid sinus causes slowing of the heart and dilatation of the peripheral vessels, while decrease in pressure in the sinus causes acceleration of the heart and vasoconstriction.

Valvular heart disease is accompanied by changes in the hydrodynamics of the circulation. In mitral regurgitation of mild degree the left auricle and the pulmonary veins may care for the increased blood content during systole without causing an increase in intrapulmonary pressure. If hypertension is present as well as mitral regurgitation, a greater amount of blood will be regurgitated into the pulmonary circuit during systole, which may well cause pulmonary congestion. In mitral stenosis intrapulmonary pressure and blood volume are

increased and sclerotic change in the pulmonary vessels follows. In aortic stenosis systole is prolonged, intraventricular pressure systole is increased, the stroke volume is decreased, the velocity of the blood passing through the aortic valve is increased, while both systolic and diastolic pressures are lower than normal.

The hydrodynamic changes in circulation which occur in aortic regurgitation are marked and have been the subject of considerable study. It has been argued that little blood actually regurgitates in this valvular lesion. That this may be considerable, however, is proven by the greater capacity of the left ventricle compared with the right as found at autopsy, the difference in capacities indicating the leakage during life. Thus the stroke and minute volumes in the presence of this lesion may be greatly increased at rest and in the presence of a normal pulse rate. The diastolic blood pressure is characteristically low and by way of compensation the systolic pressure is increased. The resultant mean pressure, however, is below normal, which is given as the reason for the characteristic pallor in these patients. More blood than normal being expelled from the left ventricle during systole, the velocity of the blood in the arterial tree is much increased above normal during early systole. The systolic pressure in the popliteal arteries being affected by changes in velocity shows therefore a marked elevation above normal in the presence of this lesion. The velocity factor in the work of the heart is increased, and, according to Evans,⁸ may even exceed that in overcoming intra-aortic pressure. The increased velocity of the blood flow in the arteries in early systole, according to Gladstone,¹¹ accounts for a more rapid flow through the capillaries. Stewart had argued the presence of a reflex vasomotor dilatation to spare the heart in this condition. Vasomotor dilatation is not, however, in keeping with the pallor present with this lesion.

The capillary pulse is characteristic of aortic regurgitation. It indicates a high pulse pressure which is due to a much greater output of blood from the heart during early systole under an increased velocity, which suddenly fills the capillaries and a low diastolic pressure, due to the leak in the aortic valve. The decrease in intra-aortic pressure during late systole is abnormally great (Fig. 10, *B, c*), but the extreme low pressure in the presence of this lesion occurs during diastole and the blanching of the capillaries is probably due to the regurgitation. In the original curves by Wiggers the point *c* in figure *B* is not designated. Although stated to be abnormally low, it must be higher than *b*.

In the presence of both aortic regurgitation and stenosis, blood pressure readings are influenced by the degrees of leak and narrowing of the valve. A high pulse pressure is usually present, although one encounters some cases in which the pulse pressure is within normal limit, the explanation of which is not clear. However, if the stenosis is extreme, systole is prolonged and diastole, during which the leak occurs, is correspondingly shortened, intra-aortic pressure is lower than normal, the left ventricle does not completely empty and there is congestion in the left auricle with a more rapid filling of the ventricle in diastole—all of which tends to minimize the amount of blood regurgitated.

Circulatory failure is of two types—the so-called forward and backward types.¹⁴ The forward type is due to a diminished cardiac output with a diminished filling of the peripheral vessels. Circulatory competence depends on a distended arterial system. Diminished minute volume beyond a certain point results in failure of the circulation. This occurs in paroxysmal tachycardia, heart block and myocardial disease. It also occurs with any marked reduction in blood volume such as that following severe hemorrhage, secondary traumatic shock or severe burns. Decline in blood volume tends to produce a decline in venous pressure which results in less blood reaching the heart.

Backward failure is the more common type and is known clinically as decompensation with passive congestion. The failure may be due to the left heart or both left and right heart. The left ventricle or auricle or both become congested and there is pulmonary congestion with right heart failure, liver congestion and ascitis. Common causes are mitral stenosis and regurgitation, left ventricular failure in hypertension and aortic regurgitation.

Circulatory failure of neurogenic origin occurs in simple fainting from emotional causes, postural hypotension, knock-out blows and in primary shock following operation or wounds even without loss of blood. The manifestation is too sudden to be due to liberation of toxins or loss of blood plasma and can only be explained on a nervous mechanism. In this type of circulatory failure dilatation of the peripheral vessels results in a lowering of peripheral resistance and blood pressure. The venous pressure is low and less blood is returned to the heart. Assuming the horizontal position is important, and thus the hydrostatic interference of return circulation to the heart is overcome. This occurs spontaneously as the patient falls in fainting, but maintenance of upright position may prove fatal.

In secondary shock following operation or wounds, the shock occurs several hours after the injury and is characterized by pallor, cold sweating, fall in temperature and blood pressure and a small rapid pulse.¹⁴ It has been shown that an oligemia exists due to a leakage of plasma from the blood into the tissues and the great veins are depleted. The blood shows a high hemoglobin and red cell count. According to recent work this loss of blood plasma is probably due to a dilatation of the capillaries produced by an liberated toxic substance resembling histadine. Several theories as to its causation have been advanced, but as yet no final answer as to the exact mechanism involved can be given. Treatment consists in rapid addition of fluid to the depleted blood volume.

Simple fainting is common. It occurs at times in young women with feeble musculature on standing for the dressmaker or when soldiers, not necessarily with poor musculature, stand long at attention. It is due to a cerebral anemia which in turn is due to an insufficient venous return to the heart. The hydrostatic pressure exerted in the venous system leading from the lower extremities is opposed to the comparatively low pressure within these veins. This interference with circulation by the force of gravity is well known in the case

of the rabbit, which, used to the horizontal position, may die if held in the vertical position too long. The rabbit lacks the vasoconstrictor mechanism necessary for adjustment in the upright position. On fainting, the individual automatically assumes the horizontal position and the blood again reaches the heart. It might be serious if the upright position were forcibly maintained. It is questionable whether locking the knees, namely, hyperextension of the knee joints, tends to cause fainting by excessive pressure on the popliteal veins. Voluntary deep respiration and grunting should aid in preventing fainting.

Some individuals faint easily and of course the blood pressure falls at such times. There is, however, a severe form of hypotension and syncope associated with the assumption of the erect posture which is comparatively rare and quite different from mere fainting.⁷ This is characterized by syncope and hypotension and a slow and unchanging pulse on standing, thus indicating a disturbance in the adjustments normally made through the sympathetic system to changes in position. The condition is often associated with other evidence of neurological disease. Blood is pooled in the dependent vessels and circulatory failure of the forward type occurs. Ephedrin and abdominal binders help in some cases.

In hypertension the work of the heart may be increased 40 to 50 per cent at rest. That is why the marked increase in work of the heart accompanying strenuous exercise should be avoided. The stroke and minute volumes are generally normal in amount.²⁹ As a narrowed arteriolar bed is present and the same amount of blood circulates, its velocity must be increased in the arterioles. This increase in velocity is accompanied by an increase in resistance. Any attempt at therapy aside from avoiding strenuous exercise should be directed at overcoming the arteriolar resistance rather than attempting to lessen the force of the heart action.

In arteriosclerosis of the larger arteries, hydrodynamics of the circulation tends to approach that encountered in rigid tubes. The blood in the aorta in early systole is less taken care of by the diminished elasticity of the aorta and the pressure transmitted to the aorta is more directly applied through the column of liquid to the periphery. The velocity of the pulse wave we know is increased. The pressure during diastole is less well sustained and is consequently lower. The systolic pressure we would expect to be higher by way of compensation. More of the work of the heart is expended in kinetic energy.

The effect of arteriosclerosis involving the large vessels on blood pressure is not at all clear. We see elderly individuals with evidence of considerable change in their vessels and little change in their blood pressures. On the other hand, it is difficult to explain blood pressure reading of 210-90 or 160-60 in elderly individuals on a basis of arteriolar change and I am inclined to attribute such a reading to sclerosis of the large vessels, although Weiss does not concur in this interpretation.

In coarctation of the aorta we have a narrowing of the aorta with local increase in the velocity and lowered pressure. Beyond the constriction the velocity becomes less and the pressure greater, but still below normal level. The heart compensates to overcome the increased resistance by hypertrophy and the pressure proximal to the constriction is increased. Increase in collateral circulation provides for a return of the blood volume which cannot take its normal course because of the narrowed aorta.

In adhesive pericarditis there is a mechanical interference with the normal hydrodynamics of the circulation. Adhesions to surrounding structures necessitates greater muscular work on the part of the heart. As adhesive pericarditis is often associated with valvular leakage there is in these cases need of dilatation as well as hypertrophy. If the thickened and often calcified pericardium prevents the required dilatation, the circulation is handicapped even with the patient at rest. If the right ventricle cannot fill sufficiently during diastole, there is back pressure and the characteristic ascites. Less blood expelled by the right heart results in less blood reaching the left ventricle and a reduced supply to the systemic circulation. The brilliant results from surgical removal of the constricting pericardium are obtained by permitting adequate diastolic filling of the heart. An important point in connection with the operation is the necessity of relieving the constriction of the left ventricle before the right. If the right ventricle is relieved first, its filling, and hence stroke volume, become greater than the left ventricle can accommodate, which may result in fatal pulmonary congestion.

In the presence of pericarditis with effusion it is readily understandable how a rapid accumulation of fluid in the pericardial sac can easily be fatal by preventing normal filling of the heart chambers. The pericardium is known to be quite resistant to acute distention. In filling, the muscles of the heart chambers exert no active suction on the blood in the large veins but filling is dependent on the low pressure in the large veins plus the negative intrathoracic pressure exerted on the heart itself.

The presence of a patent ductus arteriosus produces a disturbance in pressures. The mean blood pressure in the aorta being normally about four times that in the pulmonary artery and the aortic pressure being transmitted to the pulmonary artery throughout systole and diastole, the pressure and the volume of the blood to the lungs is greatly increased above normal, thus increasing work of the right ventricle. The right ventricle hypertrophies and dilates. Ligation of the patent ductus has proven comparatively simple and very successful in operations recently reported.

In arteriovenous fistula the arterial blood stream flows into a vein, the pressure of which is much less than that in the arterioles. Thus peripheral resistance is less²¹ and the heart shows marked hypertrophy and dilatation in most cases, the diastolic pressure is lower, and the systolic higher than normal by way of compensation. Operation results in a return of heart and blood pressure to normal.

The blood pressure in the pulmonary circuit in man is estimated at about 40 systolic and 12 diastolic. Increase in the pulmonary blood pressure is, according to Moschowitz,²² almost always a secondary process and is accompanied by arteriosclerosis of the pulmonary arteries. It occurs with any lesion in the left heart which results in back pressure in the lungs. Mitral stenosis is a common cause and in severe cases the entire lung field shows on x-ray increase in lung design from blood vessel thickening. The independence of arteriosclerosis of the systemic and pulmonary circulations indicates, according to Moschowitz, that the cause of arteriosclerosis is not toxic, metabolic nor dietary.

The fall in blood pressure encountered in spinal anesthesia is caused by the cutting off of the vasoconstrictor action of the sympathetics on the blood vessels. While there are believed to be both vasoconstrictor and vasodilator nerves to the arteries with respective centers in the brain, there is some question as to the mode of action of the dilator nerves, that is, whether it is an active process or not. Section of a nerve trunk containing both kinds of fibers and stimulation of the peripheral segment results in arterial constriction which shows a greater action on the part of the constrictor fibers. This explains the dilating action on putting the sympathetic fibers out of commission by spinal anesthesia. The splanchnic and leg vessels in spinal anesthesia become dilated and peripheral resistance is lowered, which results in a lowering of blood pressure and increased pulse rate, and if the dilated vessels acquire too much of the circulating blood, the venous return to the heart is diminished. In hemorrhage there is a prompt compensatory vasoconstriction which tends to maintain blood pressure. This is impossible in spinal anesthesia and therefore this form of anesthesia is contraindicated following hemorrhage or in operations likely to be accompanied by considerable loss of blood. The importance of the horizontal position in spinal anesthesia is apparent. Ephedrine acting on the unaffected vessels tends to minimize the lowering of blood pressure in these cases.

The application of some of the laws of hydrodynamics to normal circulation and to a number of abnormal conditions encountered clinically has been attempted in an effort to make the subject of circulation more intelligible and therefore more interesting.

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Discussion

DR. S. MARX WHITE, Minneapolis: This presentation ought not to go without discussion. I do not consider myself capable of discussing the details of this paper but I am interested in this fact that, as medicine grows and our knowledge in medicine increases, increasingly we are interested in physiology. It is true that the physiologist has been able to add very greatly to our knowledge. Physiology is one of the fundamentals in the science of medicine. Everything that Dr. Drake has presented has been of extraordinary value. He had not the time to go into other fields of hemodynamics, such as those that may play a part in fluid interchange through the vessel walls. A difficulty in all of this is that we are facing a complexity of the forces with which we deal. While he was discussing the forces in hypertension and hypotension, my mind went back to a couple of incidents that impressed it on my mind. We have been taught that in aortic stenosis there is, as a rule, much less sclerosis in the proximal portion of the aorta than is commonly found in the same age group. A patient of fifty-five years whom I had watched for several years had had an attack of rheumatic fever at the age of eighteen, none since. At autopsy, marked sclerosis was found in this vessel. Some other factor, possibly hereditary, had stepped in to modify the picture.

I did not hear Dr. Lepak's paper on hypotension at the last meeting, but I have in mind a man whom I

had studied for ten years. We found marked static hypotension to systolic pressures of 70 mm. of mercury and even lower. At no time did we find blood pressures over 135 systolic or 90 diastolic. We overcame the spells of fainting which the man had while shaving in the morning and which had been looked upon previously as mild epileptiform seizures. This was corrected largely by an abdominal belt designed to prevent over-distention of abdominal veins. This man died on the sixth day of his first attack of coronary occlusion. We found he had a heart markedly increased in weight. I don't introduce these to confuse the picture; I do it in order to bring our attention back to the fact that in the work of the physician and surgeon we are dealing with a multiplicity of forces in which many things come into the picture.

DR. MOSES BARRON, Minneapolis: The study of hydrodynamics in heart disease has assumed importance in recent years and has helped clarify many phases of congestive heart failure. It has now been fairly well established that congestive heart failure is best explained by the back pressure theory. The old concept of the forward failure theory has been abandoned. A patient with advanced heart failure from any cause, whether from hypertension, coronary disease, valvular disease or any other etiological factor, presents increased venous pressure. The minute volume cardiac output is often normal until an extreme state of heart failure develops and at times may be normal even then. There are only a few conditions affecting the heart which would produce definitely a diminished minute volume output. The two important ones are: (1) constrictive pericarditis, when an insufficient amount of blood reaches the heart because of the inability of the blood chambers to receive the normal amount; and (2) when there is tricuspid stenosis present, a condition which also results in inflow stasis. These heart conditions result in forward failure, otherwise forward failure comes when there is peripheral vascular collapse, a condition found in severe shock. A loss of tone of the blood vessels results in increased vascular bed, but especially an escape of fluid through the capillary endothelium with a diminished return flow of blood to the heart. It is important that we recognize these two distinct types of circulatory insufficiency, the one due to cardiac weakness and that due to peripheral vascular collapse. The treatment of the two conditions is altogether different. In the first, cardiac stimulants are indicated; while in the second the attempt should be made to increase the vascular tone and supply more fluid to the circulating system.

Another interesting point brought out by Dr. Drake is the inconstancy of the blood pressure associated with arterial sclerosis. If the sclerosis involves the larger vessels without affecting the pre-capillary arterioles, there may be no increase in the systolic pressure. If there is a high systolic pressure associated with the low diastolic, it may signify that there is sclerosis of the larger blood vessels which has eliminated the elasticity and prevents the vessel wall from contracting down upon the circulating blood. This lack of contraction explains the low diastolic pressure. In cases of aortic regurgitation the low diastolic associated with a high pulse pressure is probably not the result of the amount of blood regurgitating into the ventricle but rather of some reflex dilation of the peripheral vessels. The thrust of blood at systole into relaxed blood vessel walls explains the loud pistol shot tone so often elicited in cases of aortic regurgitation.

DR. DRAKE, in closing: I wish to thank Dr. White and Dr. Barron for their discussions. Dr. Barron's explanation of the reason for the comparatively low diastolic pressure readings in some cases of hypertension with arteriosclerosis is particularly interesting.

The meeting adjourned.

A. G. SCHULZE, M.D., *Secretary*

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, November 2, 1939

President, Dr. Willard White, in the Chair

Secretary, Dr. Harvey Nelson

THE SURGERY OF PEPTIC ULCER

MARTIN NORDLAND, M.D.

Minneapolis

The conception that a peptic ulcer is an acute process healing rapidly and spontaneously and that each attack of symptoms is due to a new ulcer has been widely accepted. The surgical treatment of peptic ulcer is indicated only for complications, namely, perforation, gross hemorrhage, pain intractable to medical management, pyloric obstruction which is not amenable to medical management, and gastric ulcers questionably malignant. All of these complications, with the exception of perforation, may be favorably affected by dietary measures.

While the total number of cases requiring surgery does not vary, the number of patients operated upon for different indications has been greatly modified. Surgical interference for the so-called intractable pain has diminished 50 per cent, while the number of patients operated on for massive bleeding has increased markedly in recent years. Gastro-enterostomy, which still has its place in the selected case, is no longer employed as a routine procedure. The pyloroplasty of Finney and the gastroduodenostomy of Wilken have been found to have many disadvantages. At the present time the trend is to direct efforts toward selective surgery, the responsibility of the surgeon being to select the patient for the operation and not the operation for the patient.

Twenty years ago Finsterer suggested early operation as a treatment of choice for hemorrhage from chronic ulcer because, as he contended, such hemorrhage coming from an eroded large artery at the base of a penetrating ulcer could be stopped permanently only in this way. Foreign surgeons rapidly accepted his point of view and generally adopted surgical intervention in the treatment of bleeding ulcer. In this country, Lahey is conspicuous in joining Finsterer in the adoption of the more radical procedure, such as sub-total gastrectomy for hemorrhage, as well as for the gastric ulcer in which the question of malignancy cannot be settled, and other complications. Lahey contends it is being more and more accepted that conservative surgical procedures, such as gastro-enterostomy and pyloroplasty, are no longer justifiable as routine operations for patients with gastric and duodenal ulcers. The too frequent postoperative occurrence of gastrojejunal ulcer is so resistant to medical management, has caused a great many surgeons to avoid the routine use of these conservative operations.

Acute perforation always requires surgical interference. A few small ulcers are walled off spon-

taneously by the omentum or a neighboring viscus. These patients may survive without operation. Naegeli (*Surgery*, November, 1938) reports a case in which a patient with acute perforated gastric ulcer of forty hours' standing was successfully treated with nasal suction. This procedure undoubtedly has value in the late cases. He calls attention to a disadvantage, that is, the depletion of Vitamin B radical through continuous emptying of the stomach. Evidence of this depletion was shown by the precipitation of a marked bradycardia and the improvement of the patient by the hypodermic introduction of Vitamin B. The mortality in cases with acute perforation is in direct relation to the length of time that has elapsed between the onset of the attack and the operation. Kelly (*Surgery*, October, 1939) comments that men are more prone to perforated ulcer than women, perforations occur more frequently during the middle years of life, the mortality increases with the age of the patient, and that the majority of perforations have antecedent histories of gastric disturbance and the physical findings are fairly constant, enabling an early diagnosis. Roentgenography is an aid in establishing the diagnosis in doubtful cases. The surgery in nearly every case need include no more than simple closure of the perforation. The procedures other than simple closure are used to cure the ulcer and such operations performed under more favorable circumstances carry a mortality in themselves. Simple closure may be done by placing sutures in normal tissue on either side of the ulcer in such a manner that constriction is avoided, and tying them together. If this method is impossible because of the size of the ulcer, it is necessary to use an omental tab to cover the perforation, holding it in there by loosely tied sutures passed through the edges of the ulcer. Constriction of the duodenum rarely occurs when this is done. In any event, it must be recognized that while the pylorus may seem to be obstructed, most of the swelling is due to edema. This simple procedure is usually all that is necessary since it must be remembered that many patients are cured by the fibrosis of the ulcer which follows perforation and suture (Lehman). Whether or not the abdominal cavity is drained apparently makes no difference. The mortality rate is practically the same. Kelly feels that spinal anesthesia is the anesthetic of choice. Pulmonary diseases constitute the largest group of complications if peritonitis is excluded.

Massive and repeated hemorrhages are a distinct indication for surgical intervention. Finsterer contends that the main purpose of operative treatment in the presence of acute gastric hemorrhage is reliable hemostasis, the question of a permanent cure of the ulcer being of secondary importance. For the purpose of hemostasis, a gastroenterostomy is made. In cases of bleeding duodenal ulcer, the same operative pro-

cedure is performed combined with ligation of the pylorus. The gastroenterostomy helps only indirectly to control the hemorrhage. The continuous emptying helps the permanent contraction of the stomach. Finsterer states that in gastric ulcer penetrating to the pancreas, it depends on the general condition of the patient whether the margins of the ulcer are simply excised and the stomach is sutured or a typical gastric resection is performed. If a duodenal ulcer penetrating into the pancreas is not resectable on account of its position and extent, he does not perform resection for exclusion of the ulcer but substitutes for it a simple ligation of the pylorus combined with a posterior gastroenterostomy. Excision of the bleeding gastric ulcer, he states, can always be performed and has a perfect hemostatic effect. If, however, the condition of the patient allows it, instead of excision he performs a typical gastric resection which guarantees a permanent cure. Lahey states that while he is entirely in sympathy with the selection of sub-total gastrectomy as a method of choice in the surgical treatment of duodenal and gastric ulcer, nevertheless he thinks that occasionally cases will arise in which it would be unsafe and unwise to apply total gastrectomy. It would be a mistake, he believes, for any one dealing with gastric and duodenal ulcer to take the attitude that all patients with gastric and duodenal ulcer, regardless of their age, condition, weight, or location of the ulcer, should be submitted to a sub-total gastrectomy. He believes that in bad risk cases it is better to perform an operation with which one is not as well satisfied but to which is attached a lower mortality rate. He states that from his experience occasionally there are patients with indurated ulcers low in the duodenum close to and even involving the common bile duct, with a marked degree of pyloric obstruction, in whom sub-total gastrectomy cannot be done with safety because of the fact that there would be insufficient duodenum left for the safe inversion of its end. Lahey states, however, that every patient with ulcer who is approached surgically should be considered as to the possibility of sub-total gastrectomy and estimated upon the basis of his general condition, age, weight, and location of the ulcer, and then only should operative procedure be selected. Allen and Welch conclude, from a study of 2,700 cases at the Massachusetts General Hospital, that one massive hemorrhage is an indication for operation in patients over 50; a single hemorrhage in the younger group demands a careful medical régime. If the ulcer symptoms persist, or if a second massive hemorrhage occurs, operation is indicated. They state that the type of operation to be employed depends on the presence or absence of acute bleeding. Allen states that, in dealing with acute massive hemorrhage, the bleeding is controlled by the finger while all the vessels leading into the ulcer are ligated in normal tissues. If the operation is performed after the subsidence of the acute hemorrhage, a sub-total resection of the stomach should be done. If possible, the ulcer should be resected; if not, vessels supplying it should be ligated. He has found that the earlier procedure of

gastroenterostomy for massive bleeding has been found to be unsatisfactory.

Pain intractable to medical treatment in ulcer, or ulcer which cannot be differentiated from cancer, is an indication for surgical treatment. Although medical treatment of peptic ulcer is much more satisfactory than it was formerly, a certain number of patients still fail to respond. Some have persistent pain despite the fact that they are supervised carefully in the hospital. Others improve in a hospital, but, owing to excessive business worries or unhappy home environments, have a recurrence of symptoms soon after leaving the hospital. Many find it difficult to continue proper medical diet and have repeated re-admissions to the hospital. This is particularly true of an ulcer situated on the posterior wall and which through protective perforation has invaded the pancreas. Hunt states that it is not the gastric ulcer, complicated by perforations, continued bleeding, or recurrent massive hemorrhage, or persistent gastric retention in which the difference of opinion exists as to what the management shall be. It is the crater lesions with none of these complications in which there is a lack of unanimity of opinion as to what the appropriate treatment shall be. The question that arises here is: is it a benign ulcer or a carcinoma? In many instances the clinical, roentgenological and gastroscopic findings in a gastric lesion leave considerable doubt as to just what the nature of the lesion may be. Even with the abdomen open and with the lesion in his hand, the surgeon of experience has felt uncertain as to whether it is benign or malignant. Often this can be determined only by the pathologist. While lesions with a crater of less than 2.5 centimeters in diameter are usually considered benign and lesions of a greater diameter are considered malignant, nevertheless there are many exceptions to this rule. The only procedure that is rational in these cases is sub-total gastrectomy, according to most surgeons. In those cases in which it is impossible because of technical difficulties, to resect the stomach, Finsterer's "resection for occlusion" may be employed (Gorgas).

There is a large group of patients with pyloric obstruction or stenosis, due to the formation of dense scar tissue, who are not favorably affected by dietary methods and to whom the administration of antispasmodics brings no relief. This condition may develop in young patients, but is much commoner in older ones. If operation cannot be avoided and there is excessive reaction around the duodenum, a conservative operation such as gastroduodenostomy may be done, in hope that a later total gastrectomy may be safely done. In these cases there is usually a low gastric acidity. Complete relief from symptoms in this group is usually gained through gastroenterostomy and, when properly performed, there is no danger of the postoperative gastrojejunal ulcer.

Trimble (*Johns Hopkins Bulletin*, 1936) states that it is unfortunate that the term "vicious circle" was introduced into the surgical vocabulary for it gives an incorrect idea of the nature of the cause of some

vomiting that occurs postoperatively. He states that the so-called vicious circle is nothing but high intestinal obstruction and concludes that this high intestinal obstruction is a change in the mesocolon, usually from edema, which produces the obstruction. Such an obstruction would not occur, he thinks, if the mesocolon is sutured high up on the stomach so that from one and a half to two inches of stomach projects into the greater peritoneal cavity. He feels that if the mesocolon is sutured close to the line of anastomosis on the small intestine such a change in the mesocolon will certainly cause obstruction. While the short loop suggested by Peterson obviates some of the causes of obstruction, nevertheless Trimble is certain that suturing of the mesocolon high on the stomach is one of the principal factors in preventing high intestinal obstruction.

In stenosis there are factors other than technical errors which may cause complications in gastroenterostomy. The patient may present himself in a condition in which immediate operation would be extremely risky. There may be acidosis, alkalosis, or hypochloremia, and the general bodily nutrition may be at a low ebb. The stomach wall is usually so stretched by over-distention with food that it is difficult to estimate the required size of the gastroenterostomy stoma. And its muscular tone is so poor that after operation peristalsis is delayed and weak, accounting for many of the poor results. The intestinal tract distal to the obstruction, having become accustomed to little if any reception of stomach contents, becomes sluggish and atonic, its secretions are diminished, and a sudden influx of food after a gastroenterostomy will usually produce symptoms popularly classified under the heading of gases, but really due to definite motor and secretory disturbances.

Before any surgery is attempted, a careful pre-operative management should be employed, decompression of the stomach instituted to restore it as well as possible to its normal size. Many times this is very difficult. The advent of the nasal suction has assisted much in this procedure. Because of the jejunal ulcer and other complications following posterior gastroenterostomy, many surgeons have abandoned the posterior operation in favor of the anterior gastroenterostomy. In a discussion concerning the technical problems of gastroenterostomy, Dr. Arnold Schwyzer states that the stoma in the posterior gastroenterostomy is constantly bathed in the gastric juice when the patient is in the reclining position, which he thinks might account for ulceration at this point; while in the anterior gastroenterostomy, with the normal presence of gas in the stomach, the stoma is always free from the gastric juice when the patient is in the reclining position. He has abandoned the entero-anastomosis customarily performed in the anterior gastroenterostomy by fixing the afferent loop of the jejunum to the stomach for some distance beyond the stoma, increasing the width of the anterior Lembert suture as it advances beyond this point, thereby making the opening into the afferent loop much smaller and higher than the opening to the distal loop. Schwyzer further points out that a redundant mucosa at the

stoma protects the tissues against secondary ulcer on the suture line, and, for this reason, he prefers to secure a bulky covering by pulling ample mucosa over the wound. To assist in the retention of an ample mucosa, he does not stress the careful inversion of the mucosa when the anterior half of this suture is placed. If the edges are somewhat everted, he states, the suture does not look as neat but seen from the inside there is no exposed submucosa.

When gastroenterostomy is performed on a stomach that still retains much of its dilatation, the surgeon is confronted with a difficult mechanical problem. Here, it is most important to leave the pre-operatively introduced nasal catheter in place during the operation. Before the gastroenterostomy is completed, the catheter is pushed about 20 centimeters into the distal loop of the jejunum. Besides serving as a method for feeding in the dehydrated and emaciated patient, this maneuver acts as a "splint" for the anastomosis between the bowel and the stomach. This maneuver is a modification of "transgastric jejunal feeding" introduced by Dr. Arnold Schwyzer. It is a good mechanical procedure for all gastroenterostomies, but of particular value in "splinting" the anastomosis when dealing with a dilated stomach. We have made use of the pre-operative introduction of the nasal suction tube in all of our gastric surgery, leaving the catheter in position during the operation.

Summary

It is generally agreed that the indications for the surgical treatment of peptic ulcer are limited to the complications. The operative procedures employed for the treatment of complications are more carefully selected.

Gastroenterostomy is still the operation of choice in the treatment of chronic pyloric obstruction due to ulcer. The other conservative surgical procedures have little value.

The radical attack, to control massive hemorrhage from the eroded vessel in the older patient, is accepted as the better method; while the conservative management for repeated smaller hemorrhages in the younger individual, is thought to be more desirable.

Gastric resection for peptic ulcer in the selected patient, as recommended by Finsterer, is being more commonly employed.

All patients operated upon for complications of peptic ulcer should have strict postoperative supervision by a good internist.

Discussion

DR. R. R. CRANMER: Dr. Nordland has given us the indications for surgery in duodenal ulcer. Obstruction, stenosis, perforation, repeated massive hemorrhages, and patients who have received proper medical treatment over a long period of time who do not respond to that treatment, are those that should be operated upon. I think that one can add another group to that. The group that I refer to is made up of individuals, who, because of their financial status are unable to continue a long treatment; who cannot afford hospitalization, and who require more summary treatment than the medical treatment.

The percentage of duodenal ulcer cases that come to operation seems to vary in the larger clinics. Some

state that about 8 per cent of the cases they see are eventually operated. Others report as high as 40 per cent that eventually come to operation. I think Lahey operates on about 8 per cent of his cases. Now, we have all seen a variety of operations done for this over a period of years. Fifteen or twenty years ago, the operation of simple excision of the ulcer—a longitudinal incision with transverse closure, the so-called Heineke-Mikulicz operation was done frequently, and then followed various types of pyloroplastic operations. Finney's pyloroplasty and Judd's partial pylorotomy and Horsely's pyloroplasty, which he calls a physiologic pyloroplasty, are all, of course, really gastroduodenostomies. They are, of course, used by many surgeons today. But posterior gastroenterostomy has been the operation that has been used most frequently and which probably now is more frequently done than the other operation for this condition. However, the trend today is toward a more radical operation in this class of cases. The continental surgeons have for many years done the sub-total gastrectomy for duodenal ulcer. That was not accepted in this country, nor in England, until quite recently. We did have two men here, however, who started to do that several years ago—Strauss in Chicago and Berg at Mt. Sinai, New York. They were about the only two men who used that operation for this condition, and a lot of criticism was directed toward them for using such a radical operation. I remember attending a Clinic at Michael Reiss Hospital in Chicago when Strauss was doing this operation and Lahey happened to be there. When Strauss saw Lahey, he asked him to get up and tell what he thought about the treatment of that particular case—what he would do for that case. Lahey was hesitant about getting up and saying anything, but he finally did get up and indicated in a few words that he was not yet converted to the idea of removing half of a good stomach for the cure of an ulcer in the duodenum. However, as you know now, Lahey has been converted to that idea, as he has reported very recently a large series of cases—200 done previous to a year ago. The trend then has been away from these less radical operations toward the more radical ones, the reason being, of course, that the mortality rate in good hands is less when you consider that each one of the operations that were done carried a certain mortality and very often the patient had to be operated on several times.

Lahey, in speaking about the anesthetic, said that he first used ether, but has given it up. Then he used intratracheal ethylene and has given that up. He then used spinal anesthesia (novocaine crystals) but gave that up because of the shortness of the anesthesia. However, he now is back using spinal anesthesia. He uses a very dilute solution of Nupercaine, a one to sixteen hundred solution. That produces an anesthesia of about three hours duration.

What he does is the Hoffmeister operation, which, you know, is a modification of the Billroth No. 2 operation. The connection between the jejunum and the stomach is made near the greater curvature, and the rest of the stomach closed, but the jejunum sutured to the entire stump of the stomach, in order to stabilize it and prevent it from pulling away. He removes about two-thirds or three-fourths of the stomach in this operation, and his mortality rate, previous to two and a half years ago, was about 18 per cent. His mortality rate from two and a half years ago to one and a half years ago, was about 11 per cent, and he now has operated on fifty-one consecutive cases without any mortality.

Dr. Nordland spoke about Finsterer's exclusion operation which Lahey sometimes does. Some of those cases in which it is impossible to tie off the duodenum and invert it below the pylorus, he cuts the stomach just above the pylorus and inverts the edges of the stomach. He makes certain, however, in those cases

that there is not an obstruction of the duodenum, because the accumulation of the secretion manufactured by that small part of the stomach must get out; if it does not, rupture of the suture line is apt to occur.

THE SURGICAL MANAGEMENT OF CARCINOMA OF THE STOMACH*

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At the January meeting of this Society in 1936, now almost four years ago, I reviewed my experience with the surgery of carcinoma of the stomach. I propose to review tonight the cases operated upon by me for carcinoma of the stomach during the intervening years. As a prelude to this discussion, I might add that during the past year there have been some notable contributions to the surgical literature of carcinoma of the stomach. Prominent amongst these is the distinctly unusual book of Livingston and Pack entitled "End-Results in the Treatment of Gastric Cancer." This book presents a detailed statistical analysis of the incidence and results of operative treatment of cancer of the stomach. Without question, it is one of the most informative treatises ever written upon the subject. There is also the splendid treatise of Konjetzny of Hamburg "Der Magenkrebs." This monograph deals essentially with the pathological aspects of carcinoma of the stomach, especially the relationship of gastritis to the development of carcinoma. And then there are two papers, one by Ogilvie of London and the other by Parsons and Welch of Boston. Perusal of these four references will afford satisfactory orientation on the best present-day thoughts concerning the surgical management of carcinoma of the stomach.

The experience reported by me, here, in 1936 represented cases of carcinoma of the stomach observed at the University Hospital in the thirty month period between July 1, 1933, and January 1, 1936.¹ During that period 109 cases of carcinoma were observed at the hospital. Of that group forty-four were inoperable on admission because of distant metastases or a general condition which would not allow operation. Of that group of forty-four, twelve or 27 per cent were terminal on admission and died in the hospital. Resection was done in thirty-one cases or 28.4 per cent of the entire group. Thirteen of the resections were done by me, amongst which number there was one death, a mortality of 7.6 per cent.

Results in the Present Group

The present study covers the period from January 1, 1936, up to the present time and relates only to the patients operated upon by me during this interval of time. In all, fifty-five patients were operated upon by me for carcinoma of the stomach. Exploration alone was done in eight instances with no deaths; in eight instances gastroenterostomy was done with one death; gastric resection was done thirty-nine times with eight deaths—a mortality rate for the resection group of

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20.5 per cent, a distinct increase of risk as contrasted with the smaller group operated upon in the preceding thirty month interval. The incidence of resection, however, amongst the patients operated upon by me in the present group was 70.9 per cent. Undoubtedly the indications for operation were stretched in a number of cases beyond the generally accepted orthodox indications for resection, as the subtended protocols of the operative failures will indicate:

Case 1. 1/22/36—Mr. J. E., U.H. No. 644903, age seventy-four years: Subtotal gastric resection; open anastomosis. Patient died 10 days after operation. Patient eviscerated on the fifth day. Small abscess at the site of the duodenal inversion and another at the upper end of the stoma. Evisceration undoubtedly had something, however, to do with the peritonitis.

Case 2. 4/29/36—Mrs. H. G., U.H. No. 647846, age sixty years: Extensive gastric resection for carcinoma, excising five-sixths of the stomach. Open anastomosis. Also large incisional hernia. Patient died 10 days after operation. Small abscess at the duodenal stump. Anastomosis intact. Contributing cause of death, pneumonia. Autopsy showed some coronary sclerosis.

Case 3. 12/2/36—Mr. C. B., U.H. No. 753763, age fifty-seven years: Carcinoma involving the distal three-fourths of the stomach; open anastomosis. Patient also had mild heart failure. Cause of death, gangrene of upper loop of jejunum due to torsion of loop. No enteroanastomosis had been made. Fatty degeneration of the liver and general peritonitis. Patient died four days after operation.

Case 4. 3/16/37—Mrs. C. P., U.H. No. 656619, age sixty-six years: Patient with extensive carcinoma of the stomach, adherent and fused to the pancreas. Open anastomosis, excising the greater portion of the stomach. Operative injury of the mesenteric vessels due to failure to define plane of cleavage between the pancreas and the carcinoma. Patient died three days after operation and hemoperitoneum from injury of the mesenteric vessels was found. Anastomosis was intact.

Case 5. 4/29/37—Mr. J. J., U. H. No. 652204, age seventy-three years: Extensive gastric resection, removing three-fourths of the stomach; open anastomosis. Patient could not void after operation and indwelling catheter had to be inserted. Patient died four days after operation of uremia, pulmonary edema and pneumonia. Anastomosis was intact.

Case 6. 1/5/38—Mr. M. N., U.H. No. 664896, age fifty-four years: Excision of distal two-thirds of the stomach for a very high carcinoma. Patient developed pneumococcus type II pneumonia with bacteremia. Treated by serum. Patient died three days after operation. Anastomosis intact.

Case 7. 2/6/39—Mrs. M. G., U.H. No. 675856, age sixty-two years: Patient had diabetes with a good deal of obstruction. Aseptic resection of the distal half of the stomach. Patient died 48 hours after operation of hypoglycemia due to administration of too much insulin. Small pulmonary embolus was found at autopsy.

Case 8. 2/24/39—Mr. E. G., U.H. No. 675913, age fifty-five years: Story of abdominal pain for about 10 months with a 20 pound weight loss. Considerable loss of strength. No vomiting. X-ray examination

showed a huge gastric defect which because of its size was interpreted as being possibly a lymphosarcoma, though the most likely diagnosis was carcinoma. It was believed to involve the entire stomach. Gastroscopy was done and the gastroscopist thought the esophagus might be involved. Because of the likelihood of the tumor being lymphosarcoma x-ray radiation was given prior to operation but without effect. A subtotal gastric resection, aseptic in type, was done without event. Enteroanastomosis was also made. Patient died of pneumonia six days after operation. There was also a pneumococcal peritonitis regarded by the pathologist as being hematogenous in nature. The suture lines were all intact. The operation lasted three hours. The pneumonia was treated by anti-pneumococcus serum.

Comment

I have little to say in justification for this increased mortality rate other than to indicate that resection has been extended to an increasingly larger number than heretofore of the patients explored for carcinoma of the stomach. The incidence of resection in the group here reported, I am embarrassed to say, exceeds the highest figure found in surgical literature by Livingston and Pack—that of Finsterer of Vienna, who resected 329 out of 518 cases (63.5 per cent). Finsterer's mortality for the group was 19.4 per cent. According to Livingston and Pack, Lahey's series of fifty resected cases among 109 operated upon constitutes the second highest reported resection rate (45.8 per cent). The mortality in Lahey's group was 34 per cent. Surgeons still have the enviable record to emulate of a 5 per cent mortality in 200 consecutive gastric resections for gastric cancer reported by Balfour. That gastric resection is a highly specialized type of surgery is well attested in Balfour's unusual accomplishment.

The oldest patient who survived resection in this group was seventy-eight years. I have previously had a patient of seventy-nine years survive resection for gastric carcinoma, and in a patient of eighty-one operated upon for gastric carcinoma the lesion turned out to be a benign ulcer! The patient survived.

There were nine patients over seventy in the present group and eighteen were more than sixty-five years of age. The youngest was forty-five years. There were three diabetics in the group. Two survived operation. One (Case 7 above) died of hypoglycemia from the administration of too much insulin. One patient of seventy-one (Mr. R. J., U.H. No. 685614), not counted in the operative mortality, after being ambulant for more than a week following operation, died of a small perforation in the gall bladder twenty-six days after operation. There have been no deaths in the last eleven resections done for gastric cancer.

One of the deaths listed above (Case 4) was a surgical blunder. However, I have since learned how one may now and then deal with the occasional case of this sort in which stomach, pancreas and carcinoma are fused into a single ill defined mass. By dividing the stomach proximal to the lesion and leaving the perforated portion of the carcinomatous posterior wall of the stomach upon the pancreas, the plane of cleavage between antrum, pylorus, duodenum and pancreas can be defined from above downward, usually without too great difficulty. With employment of traction upon cats-

paw retractors from alternate directions, the residual carcinoma can be shaved off the pancreas usually without great hazard. The defect in the pancreas is then to be repaired with placement of interrupted Halsted mattress sutures of fine silk. If the defect is too large to close satisfactorily the omentum can be sewn over it.

One of the most instructive deaths is that of Case 3, above, in which gangrene of the afferent loop of the jejunum occurred. A few similar instances reported in the surgical literature have come to the writer's notice. It is a wholly avoidable accident. Routine performance of entero-anastomosis between the afferent and efferent loops after gastric resection for carcinoma obviates its occurrence.

In another instance, that of Case 1 above, evisceration was the main surgical complication leading to a fatal outcome. Use of the left subcostal incision and closure of the wound with interrupted sutures of silk has done away essentially with this complication. No eviscerations have occurred now for a period of more than two years. At one time in this clinic, when closures were made regularly with running sutures of chromic catgut, evisceration was observed, following gastric resection for carcinoma, more commonly than following any other type of operation. In this instance and in one other, amongst the fatal cases, a small abscess was found on postmortem examination, at the site of duodenal closure.

One of the most difficult hurdles for all surgeons, in gastric resection, is acquisition of a safe method of inverting the duodenal stump. Use of a crushing clamp accompanied by over-sewing with several layers of running sutures of catgut will undoubtedly result in duodenal fistula in a number of instances, despite satisfactory inversion. For some time now, the writer has used the Petz sewing apparatus, after separating the medial wall of the duodenum adequately from the pancreas. A single row of interrupted mattress sutures of fine silk of the Halsted pattern is employed to secure duodenal inversion. Three additional sutures are placed anchoring an omental tab over the inverted duodenum.

More and more I have come to learn that pneumonia is, in part, a direct surgical complication. Commonly after a long operative procedure, the patient leaves the operating room with moist trachea and bronchi. The use of suction applied to an indwelling gastric tube prior to, during and after operation does away with the feature of aspiration. It is important, however, during and after operation, to employ the Trendelenburg position to avoid aspiration. Further, bronchoscopic aspiration of the trachea and bronchi by the anesthetist (a new function for him) directly after the completion of the operation, I have a feeling, will help materially in reducing the incidence of atelectasis and postoperative pneumonia. In the pneumonias which occur nevertheless, employment of sulphapyradine will reduce materially the incidence of mortality through this agency. In one of the cases, Case 5 above, uremia, consequent upon urinary retention, necessitating use of an indwelling catheter, was the immediate cause of death. For a period of some time now I have given patients needing indwelling urethral catheters after operations, because of urinary retention,

sulphanilamide subcutaneously. Its administration serves quite effectually, apparently, to obviate pyelonephritis, oliguria and uremia, and constitutes a useful means of helping to avoid complications which spell added mortality. When the carcinoma is perforated onto the pancreas, sulphanilamide is given also subcutaneously for a few days postoperatively.

Cures

It is not so long ago, that carcinoma of the stomach was despaired of as being a hopelessly incurable disease. Perusal of Livingston and Pack's monograph on gastric cancer will suffice to convince any doubting Thomas that such is no longer the case. It is, of course, important that all stubborn opposition to operation in gastric cancer be broken down. It would appear from the review of Livingston and Pack that in the group of patients surviving resection, the ultimate cures compare favorably with other intraperitoneal malignancies such as those of the rectum and colon.

Dr. George Bergh found somewhat more than a year ago in studying the fifty-seven patients who had then survived resection for carcinoma of the stomach and were well without evidence of return of the disease: one patient well ten years after resection; one eight years; one seven and a half years; one seven years; one five and a half years; another five years; and a fairly large number under five years.

Livingston and Pack, from an intensive study of the literature of reported cases, have compounded a formula to determine the likely survival periods in the resection cases. They found that, of patients surviving resection for gastric cancer, 20 per cent will live ten years, 25 per cent will survive for five years, and 33 per cent for three years. Of those patients not accepting resections the average survival after the diagnosis is made is four months. Expressed in a formula, the short term survivors in a given series (that is, those not surviving ten years) are lumped together as twenty months. The calculation for the thirty-nine patients reported here would be as follows:

Expected survival had none been operated on— 39×4 months = 156 months

Shortening of life incident to operation—8 deaths $\times 4$ months = 32 months

LIVINGSTON AND PACK'S CALCULATED SURVIVAL

20% of 31 cases = 6.2 should survive 10 years

$6 \times 120 = 720$ months

The remainder,

$31 - 6 = 25$ should survive on the average 20 months

$25 \times 20 = 500$

Total $720 + 500 = 1220$ months

Shortening of life by operation,
8 cases — 32
1188 months

The expected survival of the group without operation — 156

Estimated saving of life by operation in this series of patients
= 1032 months — 86 years.

It is obvious, therefore, that a radical operation does afford the patient with a resectable lesion a fairly bright prospect when contrasted with his expectations without operation. It is extremely unfortunate, however, that so large a percentage of a group of gastric carcinomas are inoperable when first seen.

Diagnostic Considerations

At the University of Minnesota carcinoma of the stomach is not being diagnosed any earlier during the course of the disease than it was four years ago. In the majority of instances the delay is owing largely to the time interval which elapses before symptoms are sufficiently characteristic to direct the attention of the patient or his physician to the stomach. This is true also when the patient happens to be a physician, a surgeon or even a gastric surgeon. The x-ray is still the most important agent in the detection of the presence of carcinoma of the stomach. My associate, Dr. George S. Bergh, found in studying a series of patients operated upon for carcinoma of the stomach at this hospital that the accuracy of roentgen diagnosis on the positive side was 86.5 per cent. With reference to basal indications for operation, roentgen opinion had an accuracy of 94.2 per cent.

At the time of the previous report four years ago, a patient, Mrs. M. E., U. H. No. 645079, had just been observed, in whom the diagnosis was established on gastroscopic examination, when x-ray examination was entirely negative. In the intervening years, in only one additional patient has the diagnosis been made by gastroscopic examination when x-ray examination failed to disclose the nature of the lesion. This patient, Mr. S. D., U. H. No. 686051, at operation, proved to have a large annular polypoid carcinoma on the anterior gastric wall high up near the cardia. The crater of the carcinoma measured 9 centimeters across. Subtotal gastric resection was done without event. Dr. Cecil Watson, under whose observation the patient came, suspected the presence of gastric carcinoma because of blood in the stool, anemia and weight loss. Gastroscopic examination is, therefore, a useful expedient as a diagnostic procedure. Fluoroscopic and roentgen observations in the hands of an expert will, however, reveal a higher incidence of positive diagnosis. The weakness of gastroscopy lies in failure to secure material for histologic diagnosis. A fairly large number of patients with carcinoma of the stomach have free hydrochloric acid after histamine, on gastric analysis.

Pathological Considerations

It may be said that polypi are amongst the more frequent known precursors of carcinoma of the stomach. So frequently do gastric polypi become malignant that their presence constitutes a satisfactory indication for operation. Gastric polypi are associated with achlorhydria to histamine in about 90 per cent of cases. Konjetzny has stressed gastritis as an antecedent predisposing cause of gastric malignancy. Konjetzny insists that carcinoma of the stomach never develops on a normal mucous membrane. The interstitial variety

of gastritis characterized by lymphocytic invasion of the stroma of the submucosa is generally recognized by pathologists. The variation in cell structure of the gastric glands is not so well understood, however. The atrophic gastric mucosa with polypoid elevations in which achlorhydria is concomitantly present, is probably a frequent precursor of gastric carcinoma. Since patients with an atrophic gastric mucosa and suffering from pernicious anemia are surviving for longer intervals, gastric carcinoma in this group is being more commonly observed. There are two such patients in this group: one in the resection series; the other in the group for which gastro-enterostomy was done.

Gastric ulcer is probably an infrequent precursor of carcinoma of the stomach. Dr. William MacCarty of Rochester reports the frequent presence of secondary cytoplasmia in gastric ulcers—a finding which he has not observed in duodenal ulcers. The best available factual data,^{3,4} however, suggest that carcinoma of the stomach does not develop upon a preexisting ulcer in more than 3-5 per cent of instances. The possibility of confusing gastric ulcer and carcinoma is a much more pressing question. There are instances in which a satisfactory differential cannot be made by x-ray examination, observation in bed under well supervised medical management or by the surgeon at operation. In many such instances the pathologist finds it necessary to study many blocks after paraffin fixation, in order to determine satisfactorily whether the ulcer is benign or malignant.

Prinz of Kojetzny's clinic in Hamburg has described recently prepyloric defects in which the musculature is thickened in which roentgenologist, surgeon and even the pathologist have difficulty determining with definiteness whether the lesion is benign or malignant. I have seen instances of this sort. Some are undoubtedly instances of hypertrophy of the circular muscle of the pylorus of the adult. In others, however, the defect is definitely prepyloric. On section the muscle appears thickened. There may also be polypoid thickening of the mucosa overlying the muscle at this level. Prinz believes that this condition represents a precursor stage of carcinoma of the stomach. I have seen instances of this sort.*

Surgical Considerations

Preoperative Preparation.—Patients in good physical condition without obstruction and exhibiting no evidence of anemia require no special preoperative preparation. Patients with obstruction need a preoperative period of observation in which the stomach is aspirated frequently. Mild retentions respond favorably, usually, to morning and evening aspirations and ingestion of only clear liquids. We have tried frequently in instances of high grade obstructions, due to carcinoma,

*Two recent cases observed since the time of this report have exhibited findings described by Prinz. Mr. O. B., U. H. No. 671852, age 73, presented such polypoid thickening of prepyloric and antral mucosa. Mr. T. L., U. H. No. 686930, age 65, exhibited definite thickening of the prepyloric circular muscle and of the mucosa. Both conditions after histologic study were found to be benign. Gastric resection was survived without special incident in both cases.

to get a tube through the pylorus. Almost uniformly, these attempts have come to naught despite many improvisations. Such patients usually need an indwelling gastric tube to which suction is applied to forestall the occurrence of vomiting.

Far more important, however, such patients also usually have anemia, low plasma proteins and not infrequently edema. Careful pre- and postoperative administration of fluid in suitable amounts, with special reference to chloride and caloric needs and adequate hydration, are very important considerations. Such patients may be given *too little* chloride, as well as *too much*. As suggested by Paine and Armstrong, careful daily computation of the sodium chloride in the urine and in the gastric aspirations affords, in the main, a very satisfactory check.

A number of patients with low plasma protein and anemia must have a large number of transfusions of blood or serum prior to operation. If the physical status and the local lesion will permit, I prefer to operate upon such patients in one stage rather than two, knowing that more patients will be accorded the opportunity of having the complete operation.

The Operation.—The patient arrives in the operating room with an indwelling gastric tube in place and the stomach empty. Suction is in force during the operative procedure. My choice of anesthetic is intratracheal cyclopropane. A left subcostal incision affords a more satisfactory exposure of the upper reaches of the stomach than any other. For some period of time now, I have been employing the closed or aseptic technic in all gastric resections. It is a more painstaking procedure, in that all the sutures are interrupted. I have the impression, however, that he who comes to adopt the aseptic method of gastric resection is not likely to give it up, because of the somewhat longer time necessary to perform it. The element of *hurry*, so much talked of in abdominal surgery two and three decades ago, has largely disappeared. With good planning and skilfully administered anesthesia the primary question now is, not *how quickly* but *how well* the operation is done.

The technic of the performance of aseptic gastric resection has been described in detail elsewhere¹⁵ and will not be repeated here. An entero-anastomosis between the afferent and efferent limbs of the jejunum, employed in the gastro-jejunal anastomosis, is always made to avoid the complication referred to above (Case 3). It does away largely also with the item of postoperative gastric retention.

All sutures are of silk, those employed in the anastomosis, as well as in closure of the abdominal wall. A small mastisol dressing, slightly wider than the incision, suffices as a satisfactory covering of the wound. No adhesive tape or abdominal binders are employed. Closure of the peritoneum and fascia with interrupted mattress suture of silk placed after the Halsted mattress pattern has done away with the complication of evisceration.

When the peritoneum is closed, the patient is placed in a fairly steep Trendelenburg position to encourage

gravitation of any bronchial mucus into the trachea. On completion of the operation, bronchoscopic aspiration of the trachea and bronchi is made by the anesthetist, or if the patient appears dry, aspiration of the trachea with a tube inserted through the indwelling intratracheal tube suffices.

I have come to prefer palliative gastric resection to gastro-enterostomy, where enough normal stomach tissue remains to make a suitable anastomosis. In frankly inoperable patients, a Pezzer catheter placed in the jejunum for purposes of feeding at the time of exploration helps the patient over the trying last few months of his illness.

Postoperative Treatment.—The patient is placed in his bed and maintained in a fairly steep Trendelenburg position till awake. The Trendelenburg position is maintained throughout the first half of the convalescent period at a lesser angle. Fowler's position is not employed. The patient is encouraged to move about in bed as much as he can after waking. Nurses and house officers enjoin upon him the importance and necessity for him "to move his arms and legs a thousand times a day." The nurse holds the patient's chest to avoid strain on, or pain in, the incision, and encourages him to take deep breaths and to give three or four coughs, a dozen or more times a day. Suction is applied to the indwelling gastric tube on return to the ward and is maintained, uninterrupted, for forty-eight to seventy-two hours, after which time it is clamped occasionally and then removed. Para-oral fluids are given largely subcutaneously to the older age group of patients, 5 per cent glucose in distilled water and 5 per cent glucose in saline solution being given, the amounts of each depending on the chloride and water requirements of the patient. The patient may drink water by mouth in small amounts as soon as he is awake.

Feeble patients past the mid-seventies, as well as debilitated patients at younger age levels are given oxygen directly after operation. If there is any suggestion of mucus in the throat which the patient cannot raise, repeated pharyngeal and intratracheal suction is practiced.

Summary

Carcinoma of the stomach is the most common of all malignancies and is responsible for more deaths than any other malignancy. Of patients presenting themselves in a satisfactory physical status and with a lesion still local in the stomach, resection may be accomplished with a reasonable risk and a reasonable chance of cure. Amongst the resectable group of gastric malignancies, cures compare favorably with other visceral malignancies, such as those of the colon or rectum. Unfortunately, a large number of patients still come to hospital with gastric cancer when the condition is beyond remedy. To make this group smaller, needs the concerted vigilant effort of patients, physicians and all medical and surgical specialists.

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DR. S. R. MAXEINER: It has been a pleasure to hear Dr. Wangensteen's discussion of gastric surgery at the University. I have been particularly interested in the work which he is doing with the aseptic anastomoses. Many of us have been using aseptic anastomoses for a number of years, particularly as applied to the colon. We have personally not applied it in resections of the stomach as we have preferred to do these resections without clamps, ligating all bleeding points as they are encountered. However, I am sure that I shall be using aseptic anastomoses more generously in the future.

Many years ago Cushing did a very extensive piece of work on the bacterial flora of the stomach and intestinal tract, and showed definitely that the bacterial flora of the stomach and intestine could be altered and the number of pyogenic organisms increased or decreased by the character of the food ingested. I believe that this is particularly applicable in cases where there is achlorhydria. Obstructive lesions with retention also favor bacterial increase. As a result, we have routinely taken at least three days to prepare our gastric cases by the use of sterilized food, the administration of hydrochloric acid and the repeated washing of the stomach with weak hydrochloric solutions. Those patients who have obstructive lesions at the pylorus are more thoroughly prepared and no residue is allowed to remain in the stomach overnight. In this manner we have avoided the use of clamps, cut down the number of postoperative hemorrhages and we believe we have also decreased the amount of postoperative peritonitis.

In a review of the literature which I did for this Society in 1935 on carcinoma of the stomach, it was interesting to note the reports of various clinics as to the increased operability of the surgically treated carcinomas of the stomach. It seems to me one must bear in mind that there are other things than cure alone to be anticipated in treatment of carcinoma of the stomach. Finsterer states, "Without resection every patient will die, and die in pain and misery. Therefore, I must resect whenever possible." The purpose of many of these resections, according to Finsterer, are therefore palliative. The observation of many surgeons of large

experience revealed the fact that even palliative procedures in which the primary lesion is removed, result in prolonged recession of the metastases so that the patient often lives many years without demonstrable recurrence.

We recently performed an exclusion operation on a patient of 81 years who was suffering from severe pain from far advanced carcinoma and continued hemorrhage. He was being transfused every ten days to maintain his hemoglobin. In the exclusion operation as advocated by Balfour and which Dr. Cranmer has just stated is now being used by Lahey, the stomach was divided proximal to the growth, the distal end of the cut off stomach was inverted and the proximal cut off end was anastomosed to the jejunum. This patient has had a great deal of relief from pain. It is now nine months and although he still loses some blood in the stool he has had fewer transfusions and is able to take all types of food without retention and without pain.

I think our profession has been grossly remiss in its attitude towards carcinoma by accepting such a dubious, helpless attitude. We reported 18 resections which we realize is a comparatively small number but of these, one died at the end of five years from tuberculosis and autopsy showed that there was no recurrence at the end of this period of time. I assisted Dr. Lee seven years ago in removing a stomach cancer in an elderly woman who is still perfectly well and able to do her own work. Another patient whom I resected seven and one-half years ago remains perfectly well without symptoms of recurrence. In other words, approximately 17 per cent of the eighteen cases reported have survived five to seven and one-half years.

SURGERY OF CARCINOMA OF THE COLON

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Because it is frequently encountered, yields a relatively high percentage of cures, yet carries a high operative mortality, cancer of the large bowel continues to command the special interest of the abdominal surgeon. In no field of surgery is the operator better rewarded for the careful evaluation of all the factors bearing on his patient's condition and the judicious selection of the proper surgical procedures.

The utter impossibility of standardizing the treatment of carcinoma of the colon except as to broad principles is at once apparent when one considers the numerous procedures available, the variable factors affecting the operative risk and end result and the conflicting opinions and results recorded by able and experienced men.

As my contribution to this seminar I propose to examine some of the ideas and results of other men, to report a very limited experience of my own and generally to assist in the clarification of surgical principles which will permit the more complete individualization of treatment under any group of circumstances.

History

The evaluation of present day operative procedures with their lower mortality rate is a striking illustration of the progress of which surgery is capable.

The first successful resection was reported by Kohler in 1881. Before 1889 seventeen cases of resection had

been reported with ten deaths or a mortality of approximately 60 per cent. In the next ten years fifty-seven cases were published with 37 per cent mortality. The prevailing method was resection with end to end suture.

The two-stage operation was suggested in 1890 by Heinecke who did not himself report any cases. Oscar Block of Stockholm recorded the first case of extra-peritoneal resection in 1892. Allingham, Edmunds, Hahn, Hockenegg and Rotter reported cases in the next two years. In 1895 Caird reported a successful case and in the same year Paul of Liverpool published his classical article in the British Medical Journal recording his first case treated in 1892.

Mikulicz, who did his first two-stage operation in 1898, described his exteriorization procedure in 1903, reporting sixteen cases with an operative mortality of 12.5 per cent, a rate which is creditable even today.

Only a few technical procedures have been added since. The more important are the development of aseptic technics for resection; Rankin's modification of the Paul-Mikulicz exteriorization procedure which he calls obstructive resection; and finally Devine's colostomy for the complete "defunctioning" of the distal segment containing the tumor.

Management of Obstruction

Aside from inherent factors such as the highly infectious nature of the bowel content and its uncertain and limited blood supply, those variables which operate against the success of surgery are not so much the cancer itself as the complications of the cancer. Extension of the tumor into neighboring organs, metastases, perforation with local abscess or peritonitis and most important of all, obstruction, are the obstacles to successful surgery.

Carcinoma is overwhelmingly the most common cause of obstruction of the colon. Rankin states that between 75 and 80 per cent of patients with colonic cancer have obstruction at the time they first consult a surgeon. Obstruction in the left half of the colon is eight times as common as in the right half. Burgess found evidence of acute obstructions in 35.6 per cent of 458 cases of carcinoma of the colon. Of Graham's thirty-three cases, 50 per cent were admitted with acute obstruction.

That acute obstruction of the colon is a serious condition is evidenced by a mortality rate of from 30 to 50 per cent in procedures designed only to relieve the obstruction. The work of Sperling, who demonstrated the competency of the ileocecal valve, establishes such an obstruction as of the closed loop type. A dog's colon subjected to an intraluminal pressure of from 30 to 50 cm. water will develop gangrene and necrosis of the bowel wall. Intraluminal pressures within this range were found in cases of colonic obstructions. Of twenty-six cases of acute obstruction at the Minnesota General Hospital there were nine deaths, eight of which were due to peritonitis as a result of perforation of the cecum or bowel wall proximal to the tumor.

Even incomplete obstructions are dangerous to the

patient. Proximal to the obstruction the bowel wall is distended, inflamed and edematous. In this state the permeability of the bowel wall to pathogenic organisms is greatly increased predisposing to pericolic inflammation and peritonitis, especially if the bowel is handled. In addition, stasis of contents results in a greatly increased bacterial content and increased toxicity.

As early as 1900 Körte collected fifty-eight cases of intestinal obstruction caused by colonic carcinoma with an operative mortality of 60 per cent. Exteriorization was done in eleven with 63 per cent mortality. Finster's operative mortality was 29 per cent in thirty-four cases admitted with acute obstruction and 14.7 per cent in sixty-one cases without obstruction.

There has been such unanimity of experience in dealing with obstructions that the surgical principle is firmly fixed that no direct attack on the neoplasm can be undertaken until the obstruction is relieved either by surgical or non-surgical means. In all cases of incomplete obstruction a so-called medical decompression should be attempted. This consists of a low residue diet and the oral administration of mineral oil or magnesium sulphate to liquefy the contents of the bowel. In addition oil and water or saline enemas are administered under low pressure. Successful decompression is recognized by the relief of obstructive symptoms, diminution of retained gas in the colon by x-ray and decrease in the number and volume of the liquid stools.

In acute colonic obstructions of complete or near complete degree, surgical decompression is indicated. The four procedures which may be utilized are colostomy, cecostomy, appendicostomy and ileostomy. Because of the competency of the ileocolic valve, ileostomy is of little value in decompressing an obstructed colon unless a tube be passed through the valve into the cecum. Appendicostomy has a very limited value because of the small size of the tube which can be passed through the appendiceal stoma. Neither appendicostomy or cecostomy diverts the fecal stream and is therefore less efficient than a colostomy of the permanent type with raised spur (permanent type).

Proponents of cecostomy, such as Roscoe Graham, Wilkie, Lockart-Mummery and many others, admit its limitations as a means of decompressing the colon but like it because of its simplicity. In the experience of others, Cheever, Wangenstein, Rankin, Sperling, cecostomy is either dangerous or inadequate.

Two indications for cecostomy seem logical:

1. Relief of obstructions in the ascending colon or hepatic flexure.
2. As a safety valve done coincidentally with a suture anastomosis of the bowel.

A transverse colostomy as an efficient means of decompressing the colon, is most favored. Wangenstein recommends a transverse incision through the right or left rectus. The transverse colon is brought out and held by a glass tube which is passed through the margin of the mesentery. The wound is closed around the bowel. Sutures may be inserted in the

fatty appendages but must not be inserted in the bowel wall. Gas and fluid may be aspirated or removed by a catheter held snugly in the bowel by a purse string suture. After forty-eight hours the wound has sufficiently sealed so that the bowel wall can be opened by cautery.

An impressive amount of statistical evidence is available to show that when extirpation of the malignant growth is preceded by decompression procedures the operative mortality is reduced by one-half or even two-thirds. Cheever, Finsterer, Gordon-Watson, Roscoe Graham, Von Haberer, Allen and Paus are only a few who have so reported.

Devine with his so-called "defunctioning" type of colostomy carries to the extreme the principle of relieving obstruction in the large bowel and in so doing reduces the bacterial count to a point where relatively extensive malignancies and inflammatory lesions may be removed by open suture anastomosis and with low mortality rates.

I have had one interesting experience which has led me to believe that the full possibilities of non-surgical decompression have not been realized. An elderly man was brought to Minneapolis with complete obstruction due to a carcinoma of the sigmoid. The abdomen was grossly distended. There was no vomiting. A flat plate of the abdomen revealed enormous distention of the colon. The patient was given three to four ounces of mineral oil daily by mouth and placed on a non-residue diet with the additional support of glucose solution administered intravenously. On the seventh day, because we despaired of opening his obstruction medically, he was operated upon. The transverse colon could not be delivered because of the distention but was brought up to the abdominal wall and vaseline gauze packed into the wound ready for later opening. Later, on the day of operation he began to pass large quantities of liquid stool per rectum. Colostomy was never completed. After three weeks his tumor was resected and end to end anastomosis done over a Rankin clamp. The condition of the colon at the time of operation gave no indication that obstruction had ever been present.

This, together with other less striking experiences, has led me to believe that with sufficient time and the use of large quantities of mineral oil even high grade obstructions may be relieved by non-surgical means, thereby eliminating one stage in the operative removal of cancer of the colon.

Preparation of the Patient

While the relief of obstruction is the most important of all preoperative considerations, other measures are of great importance. Dehydration and depletion of liver glycogen should be combated by intravenous glucose solution. Anemia, so common in right sided malignancies, must be overcome by transfusions and hemopoietic stimulants.

As a result of infections associated with ulcerated processes in malignant lesions it has been shown that a marked vitamin C deficiency always occurs. Lanman, Thomas and Ingalls, Taffel and Harvey and others

have shown that vitamin C deficiency interferes with wound healing. Two hundred mg. of cevitamic acid daily is sufficient to restore the deficiency. Vitamin B has a stimulating effect on appetite and on the tonicity of the large bowel. Its use is indicated preoperatively.

Efforts to increase the resistance of the peritoneal cavity to infection by the intraperitoneal injection of vaccines and various substances began in 1887 when Pawlowsky used croton oil to produce peritonitis in experimental animals. Subsequent work established the protective value of exudate in peritonitis but has not established the advisability of routine vaccination. The three most commonly used immunizing agents are:

1. Steinberg's coli-bactragen.
2. Bagen's strap and coli vaccine.
3. Amoniotic fluid.

Rankin, Bagen and Dixon popularized the use of intraperitoneal vaccines. Dixon still advocates their use.

Coller and his associates believe that the routine use of vaccines is not needed or desirable but believe when spillage of infective material accidentally occurs at operation the use of some substance which produces a rapid leukocytic response on the part of the peritoneum is of value. Steinberg's coli-bactragen has been most satisfactorily and extensively used by them. With this view Oschner and Allen are in complete accord.

The omnipresent sulphanilimide bids for a place in the preoperative preparation. Gailoch and Seley made cultures from the bowel wall in six carcinomas of the colon. In four, streptococcus hemolyticus in conjunction with bacillus coli were recovered. In twenty-one cases in which the blood sulphanilimide level was maintained at 5 to 6 mg. per cent for three days prior to operation streptococci, were not obtained and no peritonitis occurred.

Choice of Operation

Considerable disagreement is evidenced among surgeons of equivalent experience as to what constitutes the safest and most effective procedures. That technical considerations are important is suggested by the very considerable difference in results shown by different men with the same methods and under presumably similar conditions.

For example, Lahey advocates an exteriorizing operation in surgery of the right half of the colon. In his hands the procedure is safe and effective. Others who have tried it condemn it because of a high mortality rate. Cheever gets better results with open suture anastomosis. Rankin and others condemn it.

In the right half of the colon where feces are fluid, obstruction rare, blood supply scanty and lymphatics plentiful, the surgeon must choose between Lahey's exteriorizing operation, hemi-resection of the colon with ileocolostomy either as a preliminary or as coincidental procedure and resection with suture anastomosis either by aseptic or open technics.

In the transverse colon the surgeon must choose between an exteriorization procedure of which Rankin's

obstructive resection is most favored, or resection with end to end or side to side anastomosis. He must also decide whether a preliminary or coincidental cecostomy or colostomy is to be done.

In the sigmoid and recto-sigmoid the choice rests between obstructive resection and resection with end to end anastomosis. He must decide whether a preliminary colostomy is needed and whether of the ordinary spur type or of the Devine "defunctioning" type. When the lesion is low, the question is raised whether the rectum can be saved and if so whether restoration of continuity can be accomplished at the same or later time.

If one seeks the answer to these questions in the experience of others, considerable confusion arises. While there is fairly uniform agreement on the broad principles involved there is much difference of opinion in their application.

A surgeon may produce extremely favorable statistics as an argument for his particular procedure if he considers as inoperable all tumors showing adhesions to surrounding the organs or showing lymphnode enlargements. Unless he realizes that both adhesions and lymphadenopathies may be inflammatory and not malignant he is denying the right of cure or palliation to a considerable number of patients. In a series of twenty-six articles an operability of over 50 per cent is reported in two-thirds and slightly under 50 per cent in the remaining third.

In a series of 2,991 cases collected by Ochsner the mortality was 21.7 per cent. The lowest was 3.1 per cent in a series of thirty-two cases and the highest was 63 per cent of twenty-seven cases. Of 3,911 resections 30.7 per cent were alive and well five years. The highest incidence of five-year cures was obtained by Oughterson and Shelton: 52.6 per cent of a series of 131 cases.

There are few statistics to indicate the advantage of an aseptic anastomosis over open suture but those available show a small advantage in favor of aseptic methods. McFee reports a 16.1 per cent operative mortality in fifty-six cases where aseptic anastomosis was done and 18.8 per cent of thirty-two cases in which open anastomosis was done. Allen and Welch report 11 per cent operative mortality in fifty-two cases using the Parker-Kerr aseptic technic and 23 per cent of thirty-eight in open anastomosis. The same authors show 22 per cent mortality in eighteen cases in which clamps were used to effect aseptic suture. Stone and McLanahan show an operative mortality rate of 11.2 per cent for seventy-one cases in which aseptic anastomosis was done while in nineteen cases of open anastomosis there was a 26.3 per cent mortality.

Until recently it was the consensus that right sided lesions could be safely resected in one stage. Recently Allen, Rankin, Abell, Cheever, Paus, Guy Turner, Dixon have produced figures indicating that the operative mortality is distinctly less when preliminary ileocolostomy is done. Lahey's exteriorization operation for right sided lesions, while successful in his hands, has not received general acceptance. At the University of Minnesota it has been abandoned because

of a prohibitive mortality. It has the disadvantage that the greater procedure comes first and in cases of obstruction or inflammation, it does not provide for a preliminary diversion of the fecal stream.

The exponents of the single stage suture anastomosis are comparatively few. Wilkie and Lockhart Mummery favor it. Cheever and C. W. Mayo recommend resection and end to end suture in the transverse colon. The former reports an 18 per cent mortality in eleven operations and the latter 11 per cent in thirty-six cases. In ninety-five cases where obstructive resection was done on the transverse colon, C. W. Mayo had a 20 per cent mortality rate. He concluded that end to end aseptic suture in the transverse colon is a safer procedure than exteriorization. The average hospital stay in the former was twenty days and in the latter fifty-nine days. Stone and McLanahan report seventy-one cases of aseptic end to end anastomosis with 11.2 per cent mortality.

After a preliminary decompression there is a greater readiness to resect and to do a primary anastomosis. Allen and Welch record their lowest mortality rate when end to end suture is done. Devine, after he has "defunctioned" the bowel for a month, removes the cancer and either does an immediate end to end suture or more often implants the end of the bowel in the abdominal wall, waits a longer time before establishing continuity of the bowel.

In low carcinomas of the sigmoid or high recto-sigmoid malignancies, where exteriorization is difficult or impossible and where the resection of the tumor destroys the superior hemorrhoidal artery, Devine's method of closing the rectum and suturing the lower end of the sigmoid in the wound makes it possible to save the anal sphincter. Dixon utilizes a procedure of a similar nature using one less stage, in that the resection and anastomosis are accomplished at the same time. In his experience the middle hemorrhoidal arteries have always proven adequate to maintain the viability of the rectum.

The feeling is definitely against end to end suture in the descending colon and sigmoid. Even in the transverse and proximal colon the few advocates recommend either a preliminary or coincidental cecostomy or colostomy. Yet in thirty successful cases of suture anastomosis in the transverse and left colon Cheever reports eight who had no preliminary or simultaneous colostomy. None developed leaks.

He apologizes for his temerity with the statement, "This again illustrates how misleading statistics may be, for certainly no surgeon of experience would advise primary resection with suture anastomosis without making a proximal safety valve."

Although the series is small, I wish to report my limited experience with twelve carcinomas of the colon treated by one stage resection and end to end anastomosis without preliminary or simultaneous colostomy or cecostomy. Nine of the eleven cases were in the sigmoid and descending colon, one was in the splenic flexure, one in the transverse and one in the ascending colon. There was one operative death. This man developed pneumonia late in his convalescence.

At autopsy the suture line was solid and the peritoneum clean.

These cases were all ideal for any type of operation. In only one, as recently described, was there high grade obstruction and in this case non-operative means removed every residual of obstruction within three weeks. All received mineral oil by mouth, were kept on a non-residue diet for three to five days and given daily enemas.

The anastomosis was done over a Rankin clamp. In earlier cases two rows of continuous cat gut suture were used. Later the first row only was of cat gut, the outer row of silk. In every case fatty tags and omentum were utilized to cover the suture line.

Post-operatively the patient was maintained on 2,000 c.c. 10 per cent glucose solution daily given intravenously. Nasal suction was started immediately and mineral oil on the second or third day. A rectal tube was inserted for alternate hours after the first day. Most patients passed liquid stool about the fourth or fifth day. Convalescence was remarkably uneventful. In no case was there more than slight distention. There was one wound infection, no fecal fistula.

The cases are too recent to determine the outcome. One woman had a Krukenberg tumor at the time of resection and subsequently died of cancer. One man developed a recurrence near the site of resection and was successfully reoperated with the establishment of a permanent colostomy. It is probable that he will develop other metastases.

The technic is exacting and time consuming. Meticulous care is needed to preserve the blood supply. The clamps should be applied obliquely to protect the viability of the suture line at its anti-mesenteric border. It is advisable to test the effect of obstructing every major blood vessel before it is permanently crushed. On one occasion an intended local resection of malignancy of the ascending colon had to be converted to a resection of the right half of the colon because what appeared to be a minor artery, when ligated, cut off the supply to the entire cecum.

None of these cases was operated with the predetermined object of doing this type of anastomosis. Had there been any evidence of obstruction or inflammation, obstructive resection would have been done. They were so operated because they were ideal cases and because the premise was entertained that under ideal conditions and using an aseptic technic for anastomosis there should be no additional hazard to the one stage operation. By withholding food and by giving relatively large quantities of mineral oil the contents of the left half of the colon may be kept fluid enough to pass through the stoma of the anastomosis. The rectal tube sufficed for the relief of gas, although had gross distention occurred, cecostomy could have been done.

The graded type of operation has proven its safety and effectiveness. No principle in colon surgery has been more completely established and accepted. Nevertheless, there are cases in which multiple stage procedures seem unnecessary and advantage may be taken of the savings in time, expense and discomfort which the single stage operation affords.

Twelve cases is too small a series from which to draw any conclusions. Many men of far wider experience have condemned the one stage procedure on the left colon. For the present I shall persist in my belief that under ideal conditions the single stage resection with aseptic anastomosis is a reasonable, and relatively safe procedure and that by using large quantities of mineral oil, low residue diets and plenty of time patients with relatively high grade obstructions may be completely decompressed and saved the necessity of a preliminary colostomy.

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Discussion

DR. E. A. REGNIER: I think Dr. Campbell has had a unique experience in his success with eleven colon resections with primary anastomoses. I will frankly admit that my experience is much more limited. Surgery of the colon is so often complicated by either obstruction, inflammation or perforation that I have chosen the more conservative operation, namely, the modified Mikulicz operation. This operation lends itself to more lesions of the large bowel than any other one operation that I know of and with a greater degree of safety. I was impressed early in medicine by the danger of doing an anastomosis of the colon without a previous decompression operation. By thoroughly mobilizing the colon and by staggering the proximal or distal loop, extensive resections may be done in any portion of the colon, permitting exteriorization of the contaminated bowel. Obviously, as Dr. Campbell has shown, the ideal case may be safely resected and anastomosed in one stage. I believe no discussion of surgery of the colon should

be closed without calling attention to the lack of early diagnosis of these lesions, thereby raising the percentage of curable cases.

Lahey has shown that 75 per cent of all carcinomas of the colon occur between the splenic flexure and the anus. He has also shown that 65 per cent of the polyps and pedunculated adenomas occur in this same position of the bowel, hence the close correlation between these so-called innocent lesions in the occurrence of carcinoma. The early findings and removal of these lesions would probably prevent many carcinomas or would certainly lead to early diagnosis. All authors agree that 95 per cent of people with lesions of the colon have an antecedent of marked alteration in bowel habit. I believe that earlier diagnoses of malignant lesions of the colon and bringing these people to operation at a time when the lesions are purely local would raise the percentage of operability and would probably select lesions which could be removed by less complicated procedures.

ADVERSE SOCIAL FACTORS

Adverse social factors have significance in medical care chiefly because of their power to disable. Deprivations, strains and dissatisfactions have physiological effects such as depletion of bodily substance, fatigue and emotional tension which are of special importance in aggravating disability already started by organic disease. Medical care can be more economical when discovery and control of adverse social factors is instituted. This is more important in the case of chronic disease such as tuberculosis.—Social Component in Medical Care, THORNTON, J., Columbia Univ. Press, 1938.

ANTHRACO-SILICOSIS

Statistics from White Haven Sanatorium, Pennsylvania, reveal that tuberculosis of the intestine was found in only 19 per cent of the cases where anthracosis and pulmonary tuberculosis were associated as contrasted to 51 per cent where the pulmonary tuberculosis was uncomplicated by silicosis. This may be due to the extreme fibrosis present in these cases preventing the spread of the tubercle bacilli. In early or moderately advanced cases of silicosis the rate of intestinal involvement is the same as in the cases which do not have silicosis.—CHARR, R., and COHEN, A. C., Am. Jour. Med. Science, 1938, 196.

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

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APICAL LUNG TUMORS OR SO-CALLED SUPERIOR PULMONARY SULCUS TUMORS*

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PANCOAST,⁹ in 1924, called attention to a group of apical lung tumors which were associated with pain referred into the shoulder and arm of the affected side, and, in addition, to certain cervical sympathetic phenomena which produced a train of symptoms and findings suggestive of tumor of the spinal cord. Although, as early as 1838, the same group of findings had been described by Hare, little attention was paid to this interesting group of cases or to its possible etiologic significance. Pancoast was of the opinion that the tumors which give rise to this peculiar group of symptoms are pleural in origin, but he felt that, conceivably, the same condition might be produced by other conditions such as tumors of the spinal cord, meninges and neck, as well as by a cervical rib and vertebral neoplasm. Pancoast based his conclusions on a study of four cases, in three of which an exploratory surgical procedure was performed and in two of which biopsy was performed, but in none of which necropsy was performed.

In 1932,¹⁰ Pancoast applied the term "superior pulmonary sulcus tumor" to this symptom-complex and enumerated its essential features as follows: (1) homolateral pain around the shoulder and down the arm, (2) atrophy of the muscles of the arm and hand, (3) Horner's syndrome, and (4) roentgenographic evidence of a small homogeneous shadow at the extreme apex of the lung, with always a variable amount of destruction of ribs locally and often vertebral infiltration. He came to the conclusion that it must

be looked on as a distinct clinical entity. This conclusion was based on a review of his four original cases, one of which was discarded, and on four additional cases, in none of which biopsy or necropsy was performed. It is interesting to note that, without the addition of further material obtained for biopsy, he was now of the opinion that the tumors which produce this interesting condition were not pleural in origin, but rather were epithelial in origin and that most likely they originate from the fifth branchial arch. Owing to the absence of demonstrable metastasis, and owing to the absence of one or more of the characteristics that he had described, Pancoast dismissed the idea that the condition might be one of primary carcinoma of the bronchus or sarcoma of a rib.

A review of the literature reveals that the condition occurs infrequently, and that there exists considerable difference of opinion as to whether or not the condition can be looked on as a distinct clinical entity, or one of primary carcinoma of the bronchus. In order to determine, if possible, the exact nature of superior pulmonary sulcus tumor, a study is presented of all cases encountered at The Mayo Clinic during a period of ten years, from January, 1928, to December 31, 1937, inclusive, in which findings described by Pancoast as essential for such a diagnosis were encountered.

The comparative rarity of the condition was substantiated, in that only thirteen cases were encountered in which all the essential features of the disease were present. Four other cases are included in the study, as they possessed all the

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features of the first group except for Horner's syndrome. A study of these latter four cases is of special interest, in our opinion, for it tends to disprove the contention that tumor of the superior pulmonary sulcus can be considered as a distinct clinical entity.

As in cases of primary carcinoma of the bronchus, tumor of the superior pulmonary sulcus was found to occur in the male more frequently than in the female; thirteen of our patients were males, and four were females. At no age does it appear that one is exempt from the disease. The youngest patient in our group was nineteen years of age, and the oldest seventy-two; the majority, however, were in middle age. The left apex was the favorite site of the tumor; it was involved in twelve cases. The right apex was involved in five cases.

Pain was by far the earliest and most annoying symptom. It usually begins near the shoulder and tends to spread down the arm and around the scapula, on the homolateral side. It is usually intermittent in character and generally is worse at night. Early in the course of the disease, especially before the development of Horner's syndrome on the same side, and before roentgenologic studies of the thorax have been made, the condition is often mistaken for "rheumatism," neuritis or even angina, and, when the pain is suspected of being of "rheumatic" origin, tonsillectomy for relief is not an uncommon event. The condition, as a rule, is rapidly progressive and disabling. Physical examination of the thorax is generally of very little value for the detection of a tumor in the lung early in the course of the disease, and the correct diagnosis may tax the diagnostic acumen of the most careful physician. Careful roentgenologic examination of the thorax is of utmost importance and is of very great aid in early diagnosis. However, Pancoast has pointed out the ease with which the early roentgenologic changes caused by the tumor may be overlooked.

Hemoptysis, which is such a frequent symptom in cases of primary carcinoma of the bronchus, occurs less frequently in association with tumor of the superior pulmonary sulcus. Only three of our seventeen patients related a history of expectoration of blood. Two of the patients had fixation of a vocal cord on the affected side, a condition which also was noted by Kelman and Schlezinger.

Tissue for microscopic examination was obtained in nine of the thirteen cases in which the characteristic findings of tumor of the superior pulmonary sulcus were present, and in three of the four cases in which Horner's syndrome was not present. In four of the cases, two from each of the aforementioned groups, respectively, necropsy was performed, and in all four cases findings were regarded as those of primary carcinoma of the bronchus with metastasis to other organs of the body. This latter observation is especially deserving of attention because Pancoast regarded such a finding as rare or not likely to occur. Microscopic examination of the tissue removed from the tumors was reported as squamous-cell carcinoma in three cases, and was not classified as to type in one of the cases in which Horner's syndrome was absent. In three of the thirteen typical cases, surgical exploration was performed. In each instance, the tumor was inoperable; evidence of invasion of the vertebræ or ribs was present. In two of the three cases, tissue was removed from the tumor, studied microscopically, and reported as adenocarcinoma, grade 4 (on the basis of 1 to 4), according to the Broders classification. In five other cases, biopsy was performed on supraclavicular lymph nodes overlying the apical tumor (four from the typical group and one from the atypical group), and of these five cases, four were cases of adenocarcinoma and one was a chondroma. This latter case will be described in detail.

It is not necessary to present all seventeen cases in detail. However, a few cases are given to illustrate the character of the lesion which we are describing, and to emphasize certain important features under consideration. Case 1 is typical of the group in which all the characteristic findings of superior pulmonary sulcus tumor were present.

Report of Cases

Case 1.—A white man, forty years of age, came to The Mayo Clinic for the first time in April, 1933; he complained of pain in the right shoulder and general weakness. The difficulty began nine months previously, soon after changing from a sedentary occupation to an active one. The difficulty was thought to be due to his change of work. The pain was sharp in character, constant in nature and definitely worse at night than during the day. The pain was of such severity that it interfered with rest and was associated with a loss of appetite and subsequently with loss of weight. Because of the character of the pain, a diagnosis of rheu-

matism was made elsewhere, and tonsillectomy was performed without benefit. The right arm gradually became weaker, and numbness and coldness developed in the second and third fingers of the right hand. At approximately the same time, drooping of the right eyelid and absence of sweating of the right side of the face were noted. Two weeks before coming under our care, the patient experienced a chill with fever and because of this a roentgenologic examination of the

months later at home as a result of massive pulmonary hemorrhage.

Pancoast was insistent on the presence of Horner's syndrome on the affected side, as essential for the diagnosis of a tumor of the superior pulmonary sulcus. On this basis, he refused to accept the cases of Henderson which were presented to prove that the condition could not be a distinct clinical entity. Pancoast failed to realize that Horner's syndrome took place only with advance of the apical tumor or lesion until the cervical sympathetic chain on the homolateral side was involved. In one of his own cases, he noted that Horner's syndrome appeared only late in the course of the disease. We are in agreement with Stein that the presence of Horner's syndrome is only a manifestation of the degree of spread of an apical tumor; in no way is it related to a specific type of tumor occurring in the thoracic inlet. This observation is based on a study of four of our cases in which were present all the characteristics of a tumor of the superior pulmonary sulcus, other than Horner's syndrome. In two of the cases necropsy was performed and a primary carcinoma of the apex of the lung was found; in every respect the tumor resembled that encountered at necropsy in the two cases in which Horner's syndrome was present. In an additional case, a lymph node was removed from the supraclavicular fossa overlying the tumor in the apex and was found to be adenocarcinoma. Case 2 is illustrative of this group, and the similarity to the first case reported is readily apparent.

Case 2.—A white man, twenty-eight years of age, came to The Mayo Clinic, for the first time, November 18, 1938; he complained of pain in the left shoulder and arm. The pain had begun four and a half months previously. It was constant in character and was aggravated by motion. There was associated numbness of the anteromedial surface of the forearm. The pain was of such severity that it interfered with sleep and appetite. A diagnosis of neuritis was made elsewhere, and the tonsils were removed without benefit. A month before coming to the clinic, a diagnosis of Pancoast tumor was made, and roentgen therapy was administered with relief of pain for a period of three weeks.

At the time of our examination, the patient's blood pressure was 134 mm. of mercury systolic, and 84 diastolic. The pulse rate was 84 per minute and the temperature was 99.4° F. (37.4° C.). The patient held his head inclined toward the left side and fullness was noted over the left supraclavicular region but

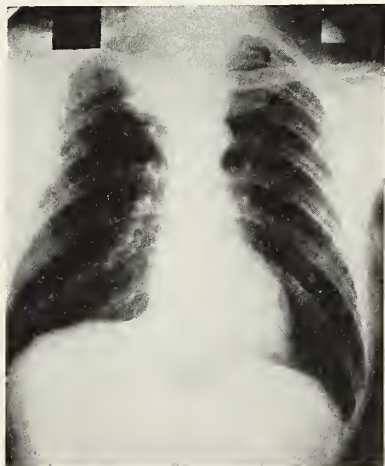


Fig. 1. Case 1. A typical case of superior pulmonary sulcus tumor.

thorax was performed; a shadow over the apex of the right lung was noted.

At the time of our examination, the patient appeared undernourished and was suffering with pain. Entophthalmia of the right eye was present, the right pupil was smaller than the left and a droop of the right lid with narrowing of the palpebral fissure was present (Horner's syndrome). There was fullness over the right supraclavicular region, a hard, nodular mass being present. There was a slight droop of the right shoulder. A slight degree of atrophy of the muscles of the right hand was noted. On percussion, dullness was elicited over the apex of the right lung, but otherwise the findings were essentially normal.

Roentgenologic examination of the thorax revealed a circumscribed shadow over the apex of the right lung. There was no apparent involvement of bone (Fig. 1). The laboratory tests, such as urinalysis, examination of the blood and flocculation tests, failed to reveal anything of diagnostic importance. The diagnosis of a tumor of the apex of the right lung (Pancoast type) was made. Roentgen therapy was administered and the patient was permitted to return home. He returned to the clinic again within a month and was without evidence of a change in symptoms or findings. An exploratory thoracotomy was performed May 26, 1933, and an inoperable carcinoma was found involving the posterior half of the apex of the right upper lobe of the lung with infiltration into the spine and ribs. The patient was permitted to return home and died five

definite lymph nodes were not palpable. The skin over the right shoulder was dusky in appearance from previous roentgen therapy. The strength of the left hand was not as great as that of the right hand. Lymph nodes were palpable in the left axilla. On percussion of the thorax, there was a slight increase

cinoma which apparently was bronchial in origin (Fig. 3).

The point frequently has been made as to whether the lesions that occur at the apex of the lung are primary in nature or are secondary to



Fig. 2. Case 2. A case of superior pulmonary sulcus tumor without Horner's syndrome.



Fig. 4. Case 3. Shadow over apex as well as at hilus.

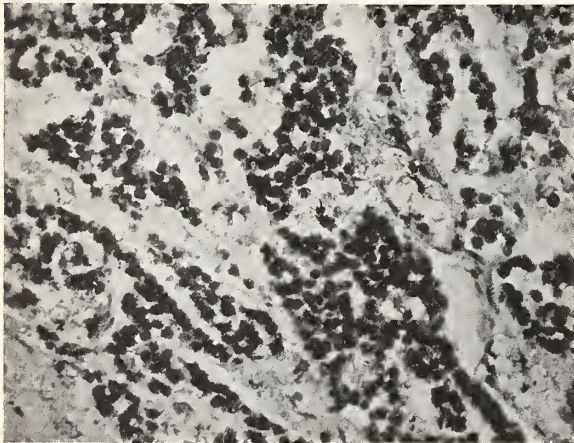


Fig. 3. Case 2. Small-cell carcinoma.

in dullness over the left apex posteriorly. There was no evidence of Horner's syndrome. Physical examination otherwise gave essentially negative findings.

Roentgenologic studies of the thorax revealed a dense shadow over the left apex of the lung (Fig. 2). The urinalysis, blood studies and blood flocculation tests gave negative results. A diagnosis of tumor of the thoracic inlet was made. Roentgen therapy was administered. In spite of this, the patient's health failed rapidly and he died at home six weeks later. Necropsy was performed, elsewhere, and tissue was sent to us for study which showed a very malignant small-cell car-

cinoma elsewhere, especially secondary to carcinoma of a bronchus close to the hilus. Metastatic lesions from other organs to the pulmonary apex have been reported by Evans, Frost and Wolpaw and others as causing the Pancoast type of tumor. The difficulty that may be experienced in determining whether an apical lesion is primary or not is well illustrated in Case 3.

Case 3.—A white man, fifty-two years of age, was admitted to The Mayo Clinic in September, 1937, because of pain in the left shoulder. The pain had appeared three months previously and was of such severity that it made the patient "dance." The pain gradually was projected down the left arm and into the left ring finger. Two months after the onset, an absence of sweating in the region of the left shoulder was noted. A diagnosis of tumor of the spinal cord was made elsewhere, and an operation was advised. At the time of our examination, the patient appeared to be in considerable distress. His blood pressure was 162 mm. of mercury systolic, and 100 diastolic; the pulse rate was 78 per minute and the temperature was 98.6° F. (37° C.). The skin over the left shoulder was dry and shiny and the temperature over the area of involvement was less than normal. Hyperesthesia was found along the medial and posterolateral surfaces of the right arm. Horner's syndrome was present and the left eye was involved. Lymph nodes were palpable in the left supraclavicular region and in the left axilla.

There was an absence of sweating over the left shoulder and arm and over the left half of the face, scalp and thorax.

Roentgenologic examination of the thorax (Fig. 4) showed a circumscribed shadow of the left apex and also of the left hilus; there was also evidence of in-

three years. Shortly before coming to the clinic he had noticed increased difficulty in swallowing, with a noticeable change in the quality of his voice.

On physical examination, a hard, firm mass measuring approximately 2 by 3 inches (5 by 7.5 cm.) was found in the left submaxillary and cervical regions.

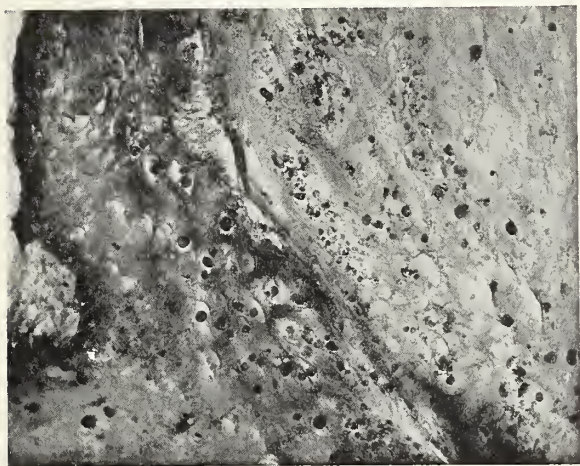


Fig. 5. Case 4. Degenerating chondroma.

vasion of the contiguous portion of the lateral part of the second thoracic vertebra and the second rib. The other laboratory tests failed to reveal anything of diagnostic importance. A diagnosis of primary carcinoma of the bronchus was made and roentgen therapy was administered in intensive doses. In spite of this, the patient's condition rapidly became worse, and he died at home four months later. Necropsy was performed elsewhere, and was reported to us as revealing primary carcinoma of the lung with metastasis to the liver.

Pancoast stated that the so-called superior pulmonary sulcus tumor was characterized by an absence of metastasis. Our experience has been at variance with this observation, however, and in accordance with that of Stein and Barton, namely, that metastasis occurs with great frequency. Nine of our patients had definite evidence of metastasis to lymph nodes, to the lung or to other organs of the body.

That lesions other than primary carcinoma of the bronchus may produce a picture similar to that described for a tumor of the superior pulmonary sulcus is well illustrated in Case 4.

Case 4.—A white man, forty-eight years of age, was seen by us for the first time in September, 1923. He complained chiefly of a swelling over the left side of the neck. This first appeared seven years previously and had especially increased in size during the last

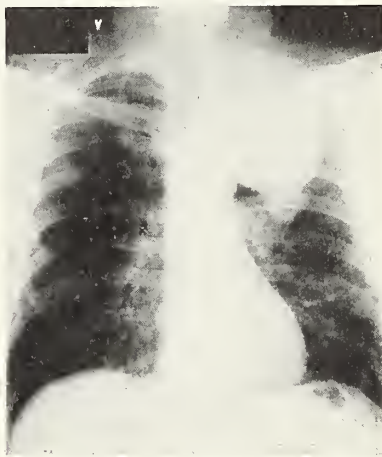


Fig. 6. Case 4. Tumor in left upper portion of the thorax.

The mass appeared attached to the hyoid bone. The mass produced a bulge into the lumen of the left wall of the pharynx, from the base of the tonsil down to the base of the tongue, pyriform fossa and along the posterior pharyngeal wall to the midline, obscuring the left half of the larynx and pushing the epiglottis over toward the right side. Roentgenologic examination of the lungs gave negative results. On September 20, 1923, the tumor was excised along with the left half of the hyoid bone. On microscopic examination, the tumor was reported as a degenerating chondroma (Fig. 5).

The patient returned to the clinic in November, 1931, because of pain in the left hand and thorax, numbness in the left forearm and hand, and a recurrence of the swelling in the lower submaxillary and cervical regions. The growth had developed during the past year. There was a slight but definite droop of the left eyelid. Roentgenologic examination of the thorax revealed a large tumor in the left upper portion of the thorax (Fig. 6) with multiple pulmonary metastatic lesions. In spite of roentgen therapy the patient failed rapidly and died soon afterward at home. Because necropsy was not carried out, some question may exist as to whether the recurrent growth was a new growth or a recurrence of the chondroma which had undergone malignant degeneration.

Comment

The prognosis for the patient who suffers from an apical pulmonary tumor is extremely grave. The great majority of such patients under our observation were dead within six months of the

time of our initial examination. Up to the present time, we have not found any form of treatment successful in dealing with the condition. In an occasional case, temporary relief was obtained through the use of roentgen therapy.

From a review of our experience we are forced to agree with Jacox, Steiner and Francis, Browder and DeVeer and others that the so-called superior pulmonary sulcus tumor cannot be a distinct clinical entity, and that it simply is indicative that a lesion situated in the apex of the lung which is in close proximity to certain nerves invades or compresses these nerves, giving rise to a characteristic train of symptoms designated by Pancoast as the superior pulmonary sulcus syndrome. The tumor that most commonly produces this symptom-complex is primary carcinoma of the bronchus. The term "superior pulmonary sulcus tumor" is not a justifiable term except when used to indicate only that the lesion or growth is limited to a distinct portion of the lung. We have seen the same symptom-complex occur when the growth is not situated in the apex, but in the hilus of the lung, and when tis-

sue could be removed for microscopic analysis and could be demonstrated to be primary carcinoma of the bronchus.

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EARLY GASTRO-INTESTINAL CARCINOMA*

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CARCINOMA continues to climb toward top place as a recorded cause of death, having now reached second place. Of a total of 3,775 deaths from cancer in Minnesota in 1938, 1,928 were of the digestive tract and peritoneum. In the United States public health statistics for 1936, of the 146,613 deaths from carcinoma, 49,930 were recorded as gastro-intestinal. It is likely that gastro-intestinal cancer is more frequent than records show. Surgery undertaken for other diagnoses and postmortems on cases of undetermined diagnosis increasingly are revealing gastro-intestinal carcinomata as the primary site.

Early symptoms of gastro-intestinal cancer may be insidious and vague. When the patient comes with marked weight loss, secondary anemia, pain, a palpable mass, marked constipation with or without alternating diarrhea, and vom-

iting, we no longer have early carcinoma but an advanced stage.

It is in middle age and beyond that these cases most often arise, although no age is free. Beginning at the age of thirty-five, there was in Minnesota in 1937 a definite increase in incidence of cancer in each successive five years of age up to seventy, then a slight increase up to seventy-five, with a slight decrease in those living in the decade beyond. In judging age it is not years alone that count, but rather the physical age of the patient.

Just as in other diseases of insidious onset, for example, tuberculosis, we have in early gastro-intestinal carcinoma symptoms of tiredness, weakness, and slight weight loss. Sara M. Jordan, of the gastro-intestinal department of the Lahey Clinic, tells in the February 17, 1939, issue of the *Journal of the American Medical Association*, of two patients with complaints of

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tiredness and general run-down condition. They took extended trips, and on their return advanced carcinomata of the stomach were evident.

Cancer's early picture is not impressive. Christopher states, "A little indigestion in any patient over thirty years should be regarded seriously." Many urge that x-ray examination be made in every patient over forty-five years of age in whom "indigestion" has existed unrelieved, even though not treated more than a week. Moynihan points out a fallacy in even this, saying: "The improvement of symptoms during medical treatment in early cancer of the stomach is one of the causes of the high mortality of this disease."

Several writers have recently agreed that the early symptoms of gastric cancer are: (1) slight loss of appetite; (2) vague stomach consciousness as fullness or "gasiness" after meals; (3) slight, vague abdominal discomfort or pain; (4) hypochlorhydria; (5) occult blood in stool. They also noted that by the time any of the classical symptoms, as weight-loss, anemia, vomiting, and palpable tumor, appeared, it was often too late for curative surgical treatment. All emphasized that cancer of the stomach can mimic almost any gastro-intestinal disease. While benign ulcers of the stomach and duodenum usually make themselves known by very definite symptoms, carcinoma, the most serious of all stomach conditions, usually begins with very negligible symptoms.

Bleeding, of which the public is so conscious in urinary and genital conditions, is strangely often minimized in gastro-intestinal carcinoma. Blood in the vomitus is often ascribed to retching, and from the rectum to hemorrhoids. In indefinite histories where there is occult blood in the stool, its presence must be explained. While in gastro-intestinal carcinoma there may be no occult blood, and one must not be misled either by its presence or absence, yet persistent occult blood in the stools is a quite consistent finding in carcinoma of the gastro-intestinal tract. Too frequently the test is not used in patients who should be suspected of this lesion. It is simple and economical. Consideration must be given not only to the finding of blood, but also of pus and mucus. Such tests must be repeated within a relatively brief period.

Regarding examinations, it has been said that if, in examining a patient, you do not put your finger in the rectum you are apt "to put your

foot in it." Osler said that a specialist is one who makes rectal examinations. This brings up, of course, the question of hemorrhoids. Insistence is for sigmoidoscopic examination either previous to scheduling a hemorrhoidectomy or at the time of the hemorrhoidectomy when the patient has been prepared. Of the 49,300 gastro-intestinal carcinomata reported in the 1936 government statistics, 7,300 were within finger reach, and another 7,000 in the sigmoid, therefore within relatively easy visualization through the sigmoidoscope. Direct visualization of the stomach through the gastroscope is becoming of increasing importance in gastric diagnosis. Abdominal palpation can never be too carefully made, and often it will reveal important findings to the examining fingers. Examination of the patient in a standing position may bring an upper abdominal mass, not felt in the horizontal position, down to where it can be palpated.

The determination of the sedimentation rate is an increasingly common laboratory procedure. Increased rate may or may not be present in early carcinoma, depending on inflammation accompanying it. The presence of bile even in small amounts seems to delay greatly sedimentation.

Hypochlorhydria is of questionable value and is found both in cancerous and non-cancerous conditions, although frequently in cancerous conditions there is a lower hypochlorhydria. Lactic acid and also the Opler-Boas bacillus occur with cancerous and non-cancerous conditions in the presence of stasis.

X-ray examination is the most accurate method of studying gastro-intestinal carcinoma that cannot be visualized or biopsied. The ability of x-ray to detect early lesions is at times amazing. Lesions as small as 1 cm. in diameter have been found and, even in the absence of definite lesions, slight changes in the mucosal pattern with almost imperceptible interference with peristalsis may give strong presumptive evidence. We have the actual picture of such a probable diagnosis by an x-ray man seeing a very small lesion in the stomach that is not palpable to the operating surgeon, and yet, on the roentgenologist's insistence on opening the stomach, there can be found a very small beginning gastric carcinoma. On the other hand, good x-ray men will miss early lesions of carcinoma of the gastro-intestinal tract, especially at the cardiac end of the stomach, in the cecum, and to a lesser degree in the remain-

ing bowel, et cetera. In a suspected case, as with unexplained occult blood or in one in which no diagnosis has been definitely made, reray must be done in the hope of picking up a lesion previously missed. A gastro-intestinal examination and follow-up is never sufficient for colon elimination; x-ray of the colon must be insisted upon as a separate procedure.

In gastric ulcer which, on x-ray examination, has the appearance of being benign, the patient should be placed in bed on a very strict peptic ulcer therapy régime. If, in ten days or two weeks, the clinical symptoms disappear, blood is absent from the stool, and x-ray shows a decreasing size of the ulcer, it is fair to assume that the lesion is benign. The medical and diatetic treatment should be under careful x-ray observation until the lesion is absent at least six months. If there is not a progressive recession or if the lesion progresses under exact medical régime, prompt operation is indicated. Gastric cancer may show an ulcer area larger but shallower than that of a benign ulcer. Gastric cancer affects males about twice as frequently as females. Of all the organs of the body, considering both males and females, world statistics would indicate the stomach to be the organ most affected by cancer.

We must remember that:

1. In so-called "benign" gastric ulcers, as distinguished from duodenal, cancer should be suspected.

2. Every ulcer on the greater curvature should be considered malignant, no matter how innocent may be its appearance.

3. The larger the ulcer, the more likely is it malignant, but any gastric ulcer, regardless of size, is to be suspected of malignancy.

4. A carcinomatous ulcer may apparently heal temporarily on strict medical régime and disappear from x-ray visualization.

5. Never disregard positive x-ray diagnoses of malignancy, even though some of them may be wrong. No matter how innocent the appearance on the operating table, the roentgenologist has an advantage over the surgeon in that he sees the normal, functioning stomach and can observe its peristalsis.

6. A negative x-ray report is never wholly to be trusted as absolutely ruling out malignancy. The increasing impression is that even with "apparently benign" reported on a large sized gastric ulcer on the greater curvature of the stomach,

and to a lesser degree on the lesser curvature, clinical history if sufficiently long followed is apt to reveal the presence of carcinoma, and that such ulcers, if they do not rapidly and completely heal, should be considered malignant.

Carcinoma of the colon develops gradually. There may be occult blood, anemia, and gradually developing weakness for many months before medical advice is sought. Due to the difference in the anatomical relations, the pathological variety of growth, and the fluid state of the bowel content in the right colon as compared with the more solid content in the left colon, we may have a difference in symptoms. The tumors in the right colon are usually flat and do not encircle the bowel. The bowel is of larger caliber and more pliable, for which reason obstruction will seldom occur unless the cancer is located at the ileocecal area. We must always keep in mind the possibility of having a well advanced carcinoma of the right side of the colon without any evidence of constipation or obstruction. On the contrary, quite often a diarrhea occurs. In the left colon a scirrhus carcinoma of smaller size which encircles the bowel wall causes gradual obstruction of the bowel. Symptoms may be heaviness in the epigastrium, irregularity of defecation with a tendency to constipation, and, at times, alternating diarrhea. If a patient of middle age or older complains of a gradually developing constipation with or without intermittent diarrhea, when there has been no acute illness, change of diet or occupation, we should think of the possibility of a gradually developing carcinoma.

Often the striking feature of gastro-intestinal carcinoma is the advanced stage reached before the patient is aroused or before the case is diagnosed. Familiar examples are a gross lesion of the greater curvature of the stomach with widespread metastases, revealed probably in a gastro-intestinal x-ray for a routine or general examination; a gross lesion in the cecum palpable to the surgeon on examination and yet not having caused the patient any alarm; an apparently sudden obstructing picture of the bowels from a gross left colon growth in a patient who until then thought only of slight gastro-intestinal inconvenience; or a gross, markedly advanced recto-sigmoid malignancy in a patient with long-standing bleeding hemorrhoids and who is shocked to think there could be any other cause than the "piles" for increasing symptoms.

There is the experience, too, of operating for another diagnosis, probably an acute condition, and finding a gross malignancy somewhere in the gastro-intestinal tract which had seemingly given no symptoms to date. Increasingly, the public has been educated to, and the medical man is demanding, more careful consideration of other possibilities in the presence of a presumably simple diagnosis, as of cholecystitis with confirmatory x-ray findings. A thorough scrutiny of the gastro-intestinal tract will often reveal additional disease, such as a duodenal ulcer, and every once in a while an early malignancy of the stomach or bowel.

Of course the question of expense often arises: In the case of charity patients or of those well able to pay, there is no problem. But with the low income group, it will be asked if we are justified in demanding such complete examinations in patients of cancer age with indefinite symptoms. There are, however, many relatively inexpensive procedures available: rectal examination, sigmoidoscopic examination, careful histories bearing in mind the vagueness of early symptoms, and, of prime importance, more frequent stool examinations. Then, if any indications exist, insistence must be made on sufficient examination to prove the condition, and usually a way can be found.

Regarding treatment, chemical approach has, as yet, yielded nothing very definite. Freezing methods are now being experimented with. Electro-coagulation or heat cauterization have a place in treatment, especially in the rectum, and at times in the lower sigmoid. The knife, x-ray, and radium are still the instruments of choice. Of these methods, it is likely that there is most difference of opinion as to indications for x-ray treatment.

It is unfortunate that so common a lesion as gastro-intestinal carcinoma should generally be very resistive to radiation therapy. Carcinoma of the stomach is particularly resistive, and at most all that can be hoped for, even with intensive high voltage radiation, is slight palliation. Lymphosarcoma of the stomach is one malignancy which does respond well to radiation and, in rare instances, possibly a permanent arrest is attained. The adenocarcinomata of the small bowel respond as poorly to radiation as those of the stomach. The carcinomata of the colon, rectum, and anus show a decreasing resistance in this order, and

vary greatly from the most resistive to the most sensitive types. Those of the cecum, ascending and transverse colons, and of the greater portion of the descending colon, as a group are as resistive to radiation as those of the stomach and small bowel. Postoperative radiation directed to their gland bearing areas also is futile, as these extended lesions are particularly resistive. The carcinomata of the lower portion of the colon, including the sigmoid, respond more favorably to radiation, but on the whole, it gives rather poor results. Postoperative radiation to the gland bearing area of this group, however, is indicated.

Descending further in the large bowel to the rectal carcinomata, we find a much greater response to radiation, and these lesions offer a good opportunity for the surgeon and radiologist to coöperate in the attainment of good results. If surgical removal of the rectal carcinoma is possible, it is the method of choice and should be followed by intense radiation to the operative site and the regional glands. In some of these rectal lesions, it may be advisable to insert radium into the lesion, and this to be supported by external roentgen radiation. The sensitivity of the rectal carcinomata in general warrant the use of intensive radiation. The anal carcinoma, which is usually the squamous cell type, is the gastro-intestinal lesion most sensitive to radiation, and is easily treated with it. Cure of this lesion with radiation is the rule, and this constitutes the one really bright spot in radiation therapy of gastro-intestinal carcinoma.

An effort has been made to restate the fact that gastro-intestinal involvement constitutes by far the largest group of carcinomata, and yet it is here that diagnosis of cancer is often longest delayed. In other regions, the public has been made more conscious of early manifestations. We, as doctors, must educate the public to the fact that if early gastro-intestinal diagnosis of cancer is to be made, the patients must come to their family consultants, not with typical textbook symptoms, but because of such vague complaints as epigastric heaviness or discomfort, "dyspepsia," lessening of appetite, any stool change or irregularity of bowel movement persisting for more than two weeks, and any unexplained weakness, tiredness, or loss in weight. Until now any unusual discharge has been stressed to the public as an early sign of cancer, and this is, generally speaking,

true, as in such instances as an unusual discharge from a sore on the face, from the nose, or from the nipple. Blood has been especially emphasized as an early sign, and this is true with cancer of the bladder and kidney, as it is also true with an irregular or unusual discharge from the female organs. Certainly blood from the stomach or rectum is to be kept before the public as a sign of cancer, but it is of utmost importance that the public be informed that, unlike the urogenital tract, blood from the gastro-intestinal tract as observed by the lay person is not usually an early sign of cancer, but often a late sign.

We must not be misled by the fact that patients

with cancer of the gastro-intestinal tract will improve on a non-roughage diet and, with mineral oil added, feces will pass narrowing obstructive points. With any suggestive history, certain procedures become immediately necessary: digital rectal examination, careful abdominal palpation, and stool examinations. In early diagnosis of cancer today, the gastro-intestinal tract presents Problem Number One because of its high percentage among cancer conditions, because of its insidious early symptoms, and because, at times, of the treachery of its relatively long existence before giving gross manifestations.

RECURRENT MYXOSARCOMA OF THE RIGHT INGUINAL REGION

Report of Case

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MYXOSARCOMATA may occur in many locations. They are most frequent in the retro-peritoneal region, the muscular fasciæ of the thigh, the bladder, and the forearm. They may occur in almost any tissue of the body, where myxomatous tissue never is found normally in the adult. They have been described in the head, breast, spermatic cord, prostate, testicles, along the course of nerve bundles, and in the pleural cavity. The age incidence is six months to eighty-three years. Most of these tumors are in the age group from forty to sixty years.

The etiology of these tumors is controversial. They probably arise due to a metaplasia of connective tissue elements. A fundamental and permanent change in the growth characteristics of some type of connective tissue cell must be assumed. The type cell is the mucous connective tissue cell as found in the early embryo restricted almost exclusively to the umbilical cord. It is a fibroblast which secretes a homogeneous, semi-fluid, intercellular substance called mucin. In a myxosarcoma many of these cells are likely to be spindle shaped. The more definite the establishment of the tumor as a malignant neoplasm, the more cellular it tends to become. A surprisingly large percentage give a history of injury, often severe, at the site of the subsequent appearance of the tumor.

Myxosarcomata of the inguinal region or thigh occur most often in the soft parts but may be attached to the periosteum of the bone.

Myxosarcomata of the thigh usually begin as a small fibrous swelling which persists and after a period of months or years suddenly begins to grow rapidly. They usually develop insidiously. Unless the tumor invades the nerves, there are no symptoms. These tumors do not metastasize early.

On physical examination the tumor appears as a large round or oval swelling. It is tough but not hard to the touch. There are no areas of fluctuation. The outline is usually not regular but contains many projections some distance from the main tumor mass. The size may vary a great deal. A myxosarcoma weighing thirty-two kilograms has been reported.

Myxosarcomata usually form lobulated or polypoid masses which may or may not be sharply demarcated and encapsulated. On section they often appear translucent, gelatinous, or colorless, but are sometimes grayish, yellowish, or reddish in part. The myxomatous portions are seen at the growing edge of the tumors. The central portions tend to become more cellular. The myxosarcomata are usually sufficiently vascular to assure an adequate blood supply to all parts. Necrosis in these tumors is observed in the more cellular parts, never in the advancing edge.

Myxosarcoma is a highly malignant tumor responding only occasionally to recognized forms of therapy. The treatment of these tumors is surgical. As a group the myxosarcomata are resistant to radiation therapy. After surgical removal these tumors are prone to recur locally. Metastases to the abdomen, lungs, vertebræ, and kidneys are quite common late in the disease. Metastases are frequently much more cellular than the parent growth. The mucoid or gelatinous property may be entirely lost in the metastases. The majority of deaths occur during the first year after treatment has been instituted.

Case Report

A white boy, ten years of age, came to us on December 17, 1938, complaining of a swelling in the right inguinal region. There had been a small, hard mass in the right inguinal region since 1930. One of us (Dr. B.) saw the patient in 1936, when a mass a centimeter in diameter was palpated below the right inguinal ligament. Surgical removal was advised at that time but was refused. The tumor did not seem to be getting any larger until January, 1937, when it began to increase in size. There was no history of injury before this phenomenon occurred.

The patient complained of some difficulty in walking and riding his bicycle because of the large size of the tumor, but these were the only complaints referable to the tumor. There was no pain. He had had a troublesome enuresis since infancy but otherwise had no urinary complaints. His bowel movements were normal. He felt well. There was no weight loss.

The urine, on examination, was normal. His blood morphology was also normal.

Examination revealed a large tough mass 3 by 4 inches in the right inguinal region, extending into the thigh and scrotum. It was not tender. It was not adherent to the skin, which could be moved freely over the tumor. The testicle could be palpated in the scrotum discrete from the tumor mass. No areas of fluctuation were felt.

On December 19, 1938, with the patient under ether anesthesia, the mass was exposed by an incision over the inguinal ligament extending into the scrotum. The capsule of the tumor was intimately connected to the surrounding subcutaneous tissue and fascia. The main body of the mass was around the saphenous vein at the fossa ovalis. The testicle was not adherent to the tumor nor was the spermatic cord involved in the tumor. There was apparently no invasion of the deep fascia of the leg or of the inguinal canal.

The saphenous vein was ligated at the fossa ovalis, and the tumor was removed by blunt dissection from the surrounding tissue. The fascia of the thigh was sutured to the fascia of the external oblique muscle, a Penrose drain was inserted in the wound, and the skin was approximated with Michel clips.

The tumor measured 10 by 12 centimeters in diameter. Grossly the tumor was grayish, very fibrous, and a cut section was quite slimy. The mass was split up into many compartments by fibrous trabeculae. Microscopic examination revealed a typical myxosarcoma.

Convalescence was uneventful and the patient was discharged on December 23, 1938.

In March, 1939, the patient was again seen, with a small two centimeter mass in the inguinal scar. On removal this growth exhibited essentially the same structure as the parent tumor.

The boy is still well and at present no metastases can be detected.

ADENOMYOMATA

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"An adenomyoma is a tumor, usually pelvic, found in, about or adjunct to the uterus, made up of connective tissue, smooth muscle and gland elements derived from uterine mucosa. The uterus, itself the commonest seat, is also undoubtedly the focus and source of dissemination of this growth, which is located within a limited radius at some point from the umbilicus down."—HOWARD KELLY.

ENDOMETRIOMATA are usually considered as belonging to the same class of tumors as adenomyomata—the essential characteristics of each being their content of epithelium resembling

uterine or tubal mucosa which responds to the stimulus of menstruation and pregnancy. MacCarty states, "an adenomyoma is any tumor in which glands and muscle play a neoplastic part and may presumably occur wherever these tissues exist in close proximity." Endometriomata, however, presumably come from transplantation of endometrial cells by way of the fallopian tubes onto pelvic peritoneum and do not contain muscular elements as a rule. However, most writers use the terms adenomyomata and endometriomata interchangeably and we shall do so in this discussion.

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 1, 1939.

Theories of Origin

Sampson's theory is that commonly held today as best explaining the origin and pathogenesis of endometrioma. He has shown that wherever misplaced endometrial tissue is found, its histologic structure is identical with uterine mucosa

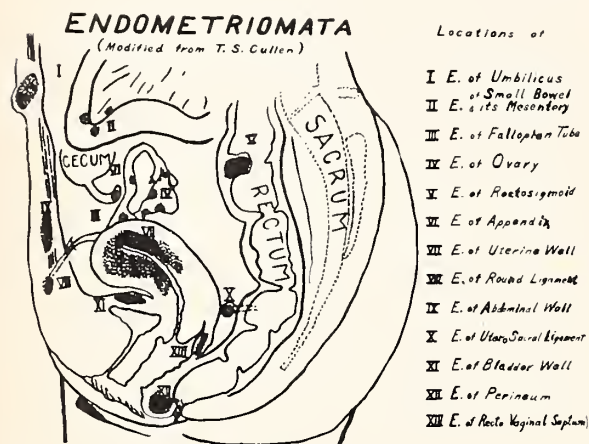


Fig. 1.

and it responds in like manner to physiological stimuli (i.e., ovarian hormones) in its reaction to menstruation, pregnancy and the menopause. According to this theory, blood and detached endometrial tissue from the uterus is regurgitated from the fallopian tubes into the pelvic cavity and results in endometrial transplants onto pelvic peritoneum—probably most often onto the ovary, primarily on account of its close anatomic relationship to the fimbriated end of the tube.

The ovary then often acts as the incubator for the endometrial cells. The so-called "chocolate cyst" develops, perforates and spills its contents, carrying endometrial particles to implant on other organs such as the abdominal wall, recto sigmoid, round and broad ligaments, etc.

Cullen in his excellent monograph in 1908 showed that many adenomyomas of the uterus had direct connection between the endometrial elements of the tumor and the endometrium of the uterine cavity.

Several other theories may be mentioned but they either are not accepted today or could conceivably account for only an occasional case. Von Recklinghausen in 1896 held that the epithelial element of adenomyomatous tumors arose from portions of the Wolffian body which had become detached during fetal life. Iwanoff suggested that endometriomata are formed by downgrowths

of the peritoneum, which has undergone metaplasia and become converted from a flattened to a columnar epithelium resembling endometrium as a result of chronic inflammation. The Mullerian theory attributes some endometriomas to the inclusion of Mullerian rests, especially in the ovary.

Endometrial transplants, especially to the abdominal wall, may also come from operation on the uterus or tubes. Several such cases have been reported after hysterotomy of the pregnant uterus, ventral suspension, etc. Lemon and Mahle of the Mayo Clinic report nine such cases of adenomyomata of the abdominal wall following various types of pelvic operations (not including cesarian section).

Frequency, Varieties and Location of Adenomyomata

There are three main varieties of adenomyomata of the uterus corresponding very much to the usual classification of fibromyomata of the uterus.

1. *Diffuse Uterine Adenomyomata*.—These are a part of the uterine wall, not demarcated or encapsulated as are fibromyomata. The uterus may be two or three times the normal size but the normal outline of the uterus is retained, although it may be somewhat irregular. On section, homogeneous translucent areas resembling mucous membrane may be seen scattered through a thickened coarsely striated portion of the wall. These areas may be brownish in color due to extravasated menstrual blood.

2. *Subperitoneal and Intraligamentous Adenomyomata*.—These are peripheral growths, having their origin in the uterus and growing outward into the broad ligament or subperitoneally. They may become pedunculated, very large and cystic, being filled with chocolate colored fluid (blood extravasated from the menstrual-like function of the endometrial lining).

3. *Submucous Adenomyomata*.—These are diffuse growths which have grown inward, become polypoid and projected into the uterine cavity and often through the cervix into the vagina.

Ovarian Adenomyomata or Endometriomata

"Chocolate cysts" of the ovary are perforating endometrial ovarian cysts filled with chocolate

colored material due to old hemorrhage. These occur during the menstrual life of the patient. They are usually small, 2 to 4 cm. in diameter, but may be as large as 15 cm. in diameter. They are usually densely adherent to surrounding structures, the result of perforations, proliferation and extension of endometrial cells and also often due to a low grade inflammatory reaction.

In addition to these more or less primary sites of adenomyomata in the uterus itself and in the ovary, lesions may be found as secondary growths or implants in the following structures: tubes, round ligaments, broad ligaments, recto-sigmoid, utero-sacral ligaments, recto-vaginal septum, abdominal wall (mostly following operations), bladder wall, etc.

These tumors may be quite benign or may prove fatal by exerting pressure on important organs, or they may obstruct a ureter or bowel. They may also develop malignant changes.

ANATOMIC LOCATION OF LESIONS

Location	Number	Per cent of Patients*
Uterus	618	69.9
Cervix	22	2.5
Ovary (probably not complete)	120	13.6
Rectovaginal septum	27	3.0
Ligaments of uterus	22	2.5
Sigmoid, rectosigmoid or rectum	24	2.7
Pelvic peritoneum	44	5.0
Vaginal wall	17	1.9
Fallopian tube	27	3.0
Umbilicus	6	0.7
Ileum	2	0.2
Appendix	1	0.1
Bladder	2	0.2
Diffuse	108	12.2

*More than one organ affected. The total, therefore, does not add to 100 per cent. (Counsellor, Mayo Clinic).

Gonzalez reports that endometriosis is twenty times less frequent in the fallopian tube than in the ovary. Sampson found endometriosis in 43 per cent of abdominal operations on women between the ages of thirty and fifty. Many showed such slight involvement that they produced no symptoms. Dougal states that for every 100 cases of uterine fibroids there are twenty-five cases of external endometriosis (i.e. endometriosis outside the uterus) and six cases of internal endometriosis (the endometrioma a part of the uterus). He also states that the ovaries are involved in 70 per cent of the cases and gives the following locations of the endometrial tumors in his se-

ries of 241 cases: ovaries—103 cases; recto-vaginal septum—62 cases; recto-vaginal septum and ovaries—71 cases. The five remaining cases showed other locations. Dougal estimates that 10 per cent of all laparotomies done by him during an eleven and a half year period had external endometriosis. In Seitz' series of sixty-five cases the endometrial tumors were in the following locations: ovary—23; uterus—19; tubes—8; Douglas pouch—4; rectum—4; parietal and visceral peritoneum—4; laparotomy wounds—4; urinary bladder—3.

Counsellor of the Mayo Clinic gave a very comprehensive summary of 884 patients with endometriosis seen at the Clinic from 1923 to 1937. These cases include uterine adenomyomata within and without the uterus and are listed in the accompanying table.

Symptomatology and Diagnosis

Adenomyomata are very interesting tumors. They produce in the uterus "a periodical increased tension due to the swelling of the various islets of mucosa, causing an intense grinding pain and a feeling of distention and dysmenorrhea as the effused blood is added to previous accumulations." If the tumor is unilateral, outside the uterus, in the broad ligament or ovary, this type of pain is unilateral.

Diagnosis must usually be made at operation or by the pathologist although a careful history and clinical examination may arouse suspicion. A patient with extremely painful periods and a hard and diffusely enlarged globoid uterus may have an adenomyoma of the uterus. Any firm tumor in the inguinal canal which enlarges and becomes painful during the menstrual period is likely an adenomyoma of the round ligament. Lockyer states, "We must regard an adenomyoma as a hemorrhagic and painful structure which is found in bad company, its intimate associates being adnexal tumors and pelvic peritonitis, parametritis and infiltration into bowel, whilst it can claim caseating tubercle, carcinoma and sarcoma as casual acquaintances."

"Endometriosis is a disease of the age of ovarian activity, for its development and progress are dependent on the same ovarian hormone that causes normal menstrual changes in the uterine endometrium" (Crossen).

Keene and Kimbrough suggest that the correct interpretation of the clinical picture as a whole

would point often to a correct diagnosis. Such a symptom-complex would be about as follows:

1. Age between twenty-five and the menopause.
2. Sterility—relative or absolute.
3. Abnormal menstruation—usually menorrhagia.
4. Dysmenorrhea of acquired type.
5. Dyspareunia
6. Sacral backache
7. Intermenstrual lower abdominal pain with increased discomfort at the time of menstruation.
8. Pain in the rectum or bladder which bears a direct relationship to menstruation.

In endometriosis we often find fixation and induration in the pelvis without evident cause, without a history of infection and with no pus present. Often a retroverted irregularly enlarged uterus fixed in the cul-de-sac without evident cause harbors an endometrioma or is attached by external endometriomata to the peritoneum of the cul-de-sac.

Treatment

Authorities differ widely as to treatment: whether it should be conservative or radical. Practically all opinion is agreed on Sampson's theory, that the endometrium is the main and only important element of adenomyomas or endometriomas and that this responds as does the uterine endometrium to ovarian hormone stimulation. It would seem to follow definitely, therefore, that to destroy the tendency of endometriomas to "menstruate," become engorged, proliferate and adhere to other organs, that the ovarian function must be removed. There may be exceptions to this rule. Perhaps, too, some endometriomata continue to grow after bilateral oöphorectomy because aberrant ovarian tissue still secretes its ovarian hormone. Conservative surgical methods have been used to try to conserve the menstrual and reproductive functions in women in the younger age group, especially when the lesions are fairly easily accessible as in the adnexal regions with possibly some peritoneal transplants. Many adenomyomata, especially the external type, atrophy following ablation of ovarian function by oöphorectomy, or destruction of ovarian function by radium or roentgen rays. In

Counsellors' series of 884 cases, 162 were treated by conservative procedure, 701 by radical procedures and twenty-one by radium and roentgen ray. In so-called internal or uterine adenomyomata, especially if the patient is near or past the menopause, hysterectomy is usually advisable as some of these lesions will become malignant.

Dougal states that true conservative treatment was possible in only 10 per cent of his series of 262 cases. He further states, "The average person's reaction to these figures will probably be one of surprise that so many radical operations were considered necessary, but it must be remembered that to be successful, conservative treatment should not only conserve function but also cure the disease. Many keen advocates of conservative surgery are likely to forget this in their anxiety to preserve the reproductive function."

Operative Findings and Pathology

Typical findings have been so well described by Novak that I quote as follows:

"The surgeon on opening the abdomen and exposing the pelvic organs finds a small adherent mass in one or both sides of the pelvis, usually attached to the posterior surface of the uterus quite low down. On loosening these adhesions to rotate the adnexa into the field of operation, there is a gush of chocolate colored or dark rusty-looking fluid, and this should at once make him think of endometriosis. On examining the ovary he will see a small cyst with a dark hemorrhagic lining, which has been opened in bringing up the adherent adnexa. The cyst may be only a centimeter or so in diameter, and is rarely larger than a hen's egg. The tube is usually quite normal, with patent fimbriated extremity, though it may be surrounded by peritoneal adhesions. On carefully inspecting, by good light, the depths of the pelvis, he will frequently see a number of rather puckered hemorrhagic areas of dark bluish color, in one or both uterosacral ligaments, and similar areas may be seen on the anterior surface of the sigmoid or rectum, or elsewhere in the pelvis.

"This, then, is a very typical picture, but it may present all sorts of degrees and variations. In not a few very mild cases the adnexa may at first sight seem quite normal, but on close inspection of the ovaries one may see a number of reddish-pink, fibrin-like areas representing tiny endometrial islands or 'implants.' Or one may see hemorrhagic areas, similar to those described, in the cul-de-sac or elsewhere, even when the ovaries seem entirely normal.

"At the other extreme are cases in which the pelvis may be filled with a 'frozen' mass, consisting of an adenomyomatous uterus, firmly adherent adnexa, and bilateral endometrial cysts, and extensive endometrial invasion of the rectal or sigmoidal wall. In fact, the bowel may be so enormously infiltrated as to simulate

malignancy, or to produce complete obstruction, while at times the invading endometrium may push far down in the rectovaginal septum.”⁸

Endometriomata in the ovary or implants elsewhere show grossly as “blood tumors”—that is, they show cavitations which contain dark blood from old and continued menstrual-like extravasations. They are somewhat cystic and show surrounding inflammatory or infiltrative reaction, whether in the abdominal wall or ovary. The most typical of these is the so-called “chocolate cyst of the ovary.” In the uterine wall translucent areas, brownish in color due to extravasated menstrual blood, are often present and are typical of adenomyomata of the uterus. The smaller peritoneal endometrial implants are rarely over 0.5 cm. in diameter and show up as bluish or brownish-red cysts, often with puckering of the tissues about them. Similar endometrial tumors in the navel, laparotomy scars, or the blue dome cysts of the posterior vaginal vault all show similar coloration and on rupture discharge old blood.

I have selected two cases illustrating some of the different types of adenomyoma and the reactions which lead to distinct problems in the management of this disease.

Case 1.—This patient, female, single, aged 33, was first seen in December, 1930, with a complaint of gradually increasing pain the past six months through the lower abdomen, especially in the right lower quadrant, pain being increased by jars and jolts, riding, stooping, etc. The pain radiated to the sacrum and the past four or five months she had had almost constant pain in the rectum, which was worse on defecation. She had urinary frequency and bearing down but no nocturia. All the above symptoms were much aggravated at the menstrual periods, which were regular and scanty and of about five days duration. She has had severe dysmenorrhea for several years, the pains beginning five to seven days before and continuing throughout the period.

Her general health has never been good. She had had recurring sinus infections, indefinite indigestion, migraine, and had always been underweight.

Examination.—General examination was essentially negative, except that there was a tenderness over the lower abdomen, especially in the right lower quadrant. Bimanual pelvic examination showed the uterus to be retroverted, irregular and apparently continuous with and fixed to a tender irregular mass in the right adnexa and cul-de-sac.

Diagnosis.—The preoperative diagnosis was probably fibromyoma of the uterus.

Operation.—At operation, December, 1930, a chroni-

cally inflamed appendix, bound down in adhesions medial to the cecum, was removed. The uterus was of normal size, retroverted and fixed to a cystic tumor 12 centimeters in diameter, which filled the right pelvis. The tumor originated from and had destroyed the right ovary and was fixed to the broad ligament and other structures. On freeing the tumor, it ruptured, spilling a chocolate colored slightly viscid fluid. The cyst wall was dissected free and removed and the bleeding from the raw surfaces controlled. A temporary type of suspension of the uterus was done to keep it from falling back into the cul-de-sac.

The patient remained free of pelvic symptoms and in fair general health until December, 1931, a year following operation, when she had severe knife-like pains across the lower abdomen, mostly in the right lower quadrant, eight or ten times each day of her menstrual period, with much bearing down. The pelvis was essentially normal.

In June, 1932, there was a recurrence of pelvic and referred pains much like she had had before her operation. Periods recurred about every two weeks, lasting about six days with an increased amount of flow, clots, and severe pain so that the patient had to spend three days of each period in bed. She developed increased lumbo-sacral backache and pressure on the rectum, which was made worse by walking, riding in the car, etc. She had fever and tachycardia for long periods.

Examination showed a tender indurated area five centimeters in diameter in the suprapubic portion of the old operative scar. Bimanual examination showed the fundus fixed in retroversion and irregular pea-sized nodules were present in the cul-de-sac, across the front of and adherent to the rectum but not fixed to or eroding into the rectal mucosa. This condition continued to progress slowly with the nodules in the cul-de-sac becoming gradually larger and more confluent. The suprapubic mass became more tender at each menstrual period and finally became bluish in color and discharged a dark bloody material through a suprapubic sinus most of the time but in increased amounts at menstrual periods. A biopsy of a specimen of the suprapubic mass, October, 1933, was diagnosed as (1) endometrioma and (2) low grade subacute infection by Dr. E. T. Bell.

At operation, June, 1934, we resected the section of the suprapubic abdominal wall involved in the adenomyomatous lesion (3 x 4 x 2 cm.)

There was no evidence of ovarian tissue in the right pelvis. Confluent pinkish nodules involved the cul-de-sac and extended across the rectum and posterior aspects of the broad ligaments. The left ovary was irregularly enlarged to three times its normal size, showed purplish areas and was fused with the left tube and broad ligament. The fundus showed small subserous nodules. We removed the left ovary and the outer two-thirds of the left tube, together with the involved posterior aspect of the left broad ligament. Dr. E. T. Bell made a diagnosis of endometrioma of the abdominal wall tumor and left ovary. The wound was closed without drainage and radium needles were placed in the abdominal wall at the site of the tumor.

GREETINGS FROM THE ALUMNI--HAGEN

Her convalescence was uneventful and we were able to follow the gradual subsidence and finally the disappearance of the nodules and the induration in the pelvis. There has been no recurrence of the abdominal wall or pelvic tumors. The patient had mild menopausal symptoms for two to three years and no menstrual flow following the last operation. Her general health has continued good except for migraine.

Case 2.—This patient, female, married, aged 63, was first seen March 21, 1931.

Past History.—In 1906 the left tube had been removed for tubal pregnancy. This was followed by a postoperative rupture which was repaired in 1910 and this was followed by a second postoperative rupture which was repaired in 1925 at the University Hospital. Menopause had occurred at forty-eight.

Present Illness.—She had profuse vaginal bleeding in September, 1930, and passed several tissue-like masses. She had spotting from then until January, 1931, and had a second moderately severe hemorrhage March 8, 1931, and passed a "tissue mass the size of a kidney" (description as given by patient suggested a pedunculated submucous adenomyoma or fibromyoma) and slight bleeding continued and became profuse March 20, 1931, requiring packing. Examination of the pelvis showed a patulous elongated cervix with a stump of tissue projecting through the os suggestive of the pedicle of a submucous fibroid. The fundus was the size of a small to medium grapefruit.

Thorough curettage was done and Dr. E. T. Bell reported the tissue to be a submucous adenomyoma. Heavy radium dosage was given following dilatation and curettage on four different occasions, from March, 1931, to February, 1932, but with only temporary help. The tissue removed on curettements was pale pink and soft, with some gelatinous areas. The specimen sub-

mitted to Dr. Bell, February, 1932, was diagnosed as myosarcoma.

It was realized she would be a very poor surgical risk on account of her age, weight (260 pounds), hypertension (260/138), but since the tumor did not respond well to further radium, operation was done, June 9, 1932, under combined spinal and general anesthesia. The uterus was one and one-half times the normal size and its peritoneal surface was irregular and indurated. There was considerable thickening and induration in each broad ligament adjacent to the uterus. No definite glandular metastasis were found outside of the pelvis. The tubes and ovaries were atrophic. A total hysterectomy was performed and the patient had an uneventful recovery.

A recurrent mass was treated by radium needles, October 3, 1932, but the patient died later, elsewhere.

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GREETINGS FROM THE ALUMNI*

O. J. HAGEN, A.M., M.D., F.A.C.S.

Moorhead, Minnesota

MR. Toastmaster, President Ford, Members of the Board of Regents, distinguished guests and ambassadors from afar, members of the faculty of medicine, alumni, and friends of the University and the Medical School:

So many impressive commemorative addresses and valuable contributions from distinguished members of the medical profession and representatives of the allied sciences have been given during these two days that towards the celebration's close no one can quite hope to measure up to the

task assigned, and that is the thing that painfully distresses me personally at this otherwise enamoring hour. Surgeon General Parran's statesman-like and masterly presentation at yesterday's Convocation, Dean Diehl's, President Ford's, Governor Stassen's and Dr. Carlson's addresses of last night were masterpieces worthy of remembrance. They should be sealed in caskets of gold to be opened and the contributions read at the 100th anniversary. None of you, not even I, will be present to hear and enjoy them—but they will testify eloquently to the fact that there were Giants in the Earth in our day who were in the

*Banquet address on the occasion of the 50th Anniversary of the Founding of the University of Minnesota Medical School, October 13, 1939.

trenches of our social order battling for a better day. I was present, as was Dr. Ford, at the Harvard tercentenary, and we came to realize how much the voices out of the past mean on such an occasion. Caskets sealed 100 years were opened and we listened breathlessly as they read what they contained.

On an occasion like this when I am not speaking for myself alone but representing upon this program a lordly group—the alumni of the medical school—numbered among whom are some of the world's great surgeons and medical men, what disconcerts me is that I feel inadequate to the task, and that I may unwittingly say the wrong thing as a little old lady friend of mine in Moorhead once did. Her neighbor lady had lost her husband. He had taken the vulgar way out by hanging himself in the attic. In such a situation it is trying to know just what to say in consolation and the little old lady worried about it. But she decided to go and when her daughter returned she found her mother dressed up and ready. Said her daughter, "Now you know, Mother, you talk too much anyway and you get yourself into trouble." She resented the allegation and retorted, "I guess I know what I am doing. It has stopped raining and I can talk about the weather, can't I, and that has certainly nothing to do with her husband hanging himself in the attic." With that retort she started over across the back lot. Fortunately, she found her friend standing on the back stoop. She said, "Good morning, Mrs. Jackson, fine day out." The bereaved friend replied, "I should say not—look at my washing hanging out there on the line—the clothes are not dry yet." "Well, Mrs. Jackson, I shouldn't think you would have such a hard time getting your clothes dry—you have such a big attic to hang things in."

But I certainly cannot be saying "the wrong thing" when I venture the assertion that never before has the campus of the University entertained so many distinguished medical men, so many chemists, physiologists, biologists at one and the same time. These latter—allies of the profession—have furnished the modern reconstructed temple of medicine not only the foundation stones upon which it is rebuilt but the chemist and the physicist among them have provided it with the armamentaria by which it is able to carry on its impressive warfare against disease. Thank God that in the re-

public of science and medicine there are no tariff barriers, no embargoes, no "black-outs." In the warfare against disease, the chemist has given the profession the anesthetics, the antiseptics, the vitamins, radium, the serums, the vaccines, the salvarsans and the sulfanilamides. The physicists have given us the x-ray, the spectroscope, the ultra-microscope. Together they have by their speculative minds penetrated the universe of the atom and revealed much of its mystery. Subtract their important contributions and scientific medicine will still be in its infancy. So we are happy and grateful that distinguished representatives of all these allies were invited to this celebration and have honored us by their presence and their inspiration.

So we are glad for anniversaries because they are timekeepers of progress. To those who are directly connected with such an event, they become occasions for appraisal of what the years have meant in terms of achievement, occasions for refreshing the minds regarding the historical background of the venture, for recalling the names of those that gave it impetus and carried on in faith and sacrifice. They are occasions too for renewing friendships among those connected in one way or another with it, and, surely occasions for reminding one another of the obligations in relationship to it. Then, too, it would be an unworthy discipleship that would not on such an occasion pause to envision the future and fail to re-dedicate themselves to the venture's continued nurture and development. Institutions worth the survival grow in proportion as they are buttressed by the spirit that founded them and by the faith and genius of those that come after.

Medicine is an ancient Guild. To its honor let it be recorded on this 50th anniversary that it has built the one great republic that has come out of a dark distant past to withstand all storms and to grow into an efficient human agency dedicated to the high service of man's welfare.

Tonight I come to you representing the 3,600 and more alumni of the University of Minnesota Medical School—the living and the dead. I am here to bring to this distinguished assemblage, their greetings and their cheers. We, as alumni, salute tonight the institution's distinguished past. We entertain the fond hope that in the second half century its achievements may be even greater, and that there may be vouchsafed for it a

continued wise leadership, buttressed by the highest scholarship and the most dynamic teaching power medical science and practice afford.

Minnesota is a proud state—for more reasons than one. I could enlarge upon this subject but it would consume several days. But one of its chiefest glories lies in the medical men it has produced. But yesterday we committed the mortality of two of them to the good earth and the immortality of their spirits to the memory of a grieving world. They were Minnesota-born and their names were lovingly known as Dr. Will and Dr. Charlie. So great were those Minnesotans, that eight years ago they were denominated among the seven greatest personages in their generation—the world over. Into this amazing half century they moved in, hand in hand, to write the most thrilling chapter in all the history of medicine. To their door the world made a beaten path though they lived in a forest. By their high performance they perfused medical practice with such incandescence in this state and the world as to light a pathway across it that will illumine it for centuries to come. They left lights flashing when and where they fell, and the alumni of Minnesota bow tonight in reverence and gratitude not only for the inspiration they gave but also for the monumental legacy they left their native state in the Mayo Medical Research Foundation they created that the profession might acquire a greater competence in the endless battle against disease. That is why I said that Minnesota is a proud state.

We would be recreant to a duty we owe did we fail as alumni upon this occasion to pay tribute to the then President of the University, Cyrus Northrop, whose memory is to me a perpetual inspiration, and to the great Board of Regents of those early days, who made the medical department a tangible and intangible part of the University of Minnesota. It was their vision, their faith, and their courage that created the medical school. They built more greatly than they knew, as most pioneers often do for their generation. We name tonight in reverence its successive deans: Millard, Ritchie, Westbrook, Lyon, Scammon—all but one now gone to his reward; not only to them this adulation but also gratitude to those early medical faculties that gave to the institution so much of faithful and impressive service. Grateful too are we to you, Dean Diehl, to whom but a few years ago was

tossed the flaming torch; yours is the responsibility and privilege of carrying on—to the end that from out of these medical halls may continue to go out highly trained human products worthy of a great profession. Somehow, we alumni feel just a little chestier when our Alma Mater receives trophies at its altars from the world's battle fields of endeavor of those who once were here. We note with pride your auspicious beginning and we look forward in the hope that the noonday of your reign "may keep the promise of its morn."

With you, President Ford, rests the heavy responsibility of breathing the breath of life into this great academic and professional aggregation of colleges—the job of coördinating the various departments that all may flower into deepest hues according to their kind. This university whose head you are is the sanctuary of the inner life of this great commonwealth. I know you will guard its sacred prerogative of academic freedom as is guarded the tomb of the Unknown Soldier in Arlington. Let no sinister hands ever pull it down from the high place it occupies in the intellectual firmament of the world.

A medical school linked intimately with a great university is twice blessed, as Dr. Parran emphasized in his convocation address yesterday, and we alumni appreciate the *Unitas Fratrum*. The advantages of this most natural union are manifold and reciprocal. It is a spendthrift state that educates but one part of a man and sends him out into its social order with but cunning-niggard of the human excellencies that makes him a great and understanding citizen as well, and, unresponsive to the things that life holds of beauty and of other worth. The presence of men eminent in all the various departments of knowledge imparts dignity, worth and stability to the whole institution. All the professors in such an intellectual empire are under a compulsion which tends constantly to keep them at a higher level. Their products come to bear the impacts of a greater universality of interests and character. The spirit of emulation with other faculties of high scholarship improves the standard of work and makes for a better product. The center for continuation study—the brain child of the late lamented President Coffman—is one of the finest projects in modern education. Its work is being watched throughout the world. The medical continuation project is most ably directed by Dr.

Wm. O'Brien. He knows what the profession needs most, and through this agency he is giving a matchless service to it. I saw him resurrect a man sixty years old who died professionally thirty years ago.

President Ford, we of the alumni have faith in your intellectual and administrative leadership. We know you are steeped in the university tradition. Great historian that you are, you are capable of mentally encompassing not only the past but also capable of envisioning the fateful future of a world beset with trouble. As an alumnus and as a citizen of this state, I took occasion but a year ago to express gratification over your election to succeed America's greatest educational statesman, Dr. Coffman, to the presidency of the university and to congratulate the commonwealth on so wise a choice. In that same message I wrote: "It has been the greater part of your distinguished life-work here to help build and fashion the institution into the great intangible thing it has become, now ranked among the foremost universities in the nation. You have in your twenty-five years of association with it watched it grow in attendance from 5,000 to 15,000 students—the second largest state university in America. You have seen the campus extended and the buildings multiply. You have observed its faculty increase from a few hundred to nearly 1,500, numbered among which are some of the world's great scholars. You have seen not only departments added but also deepened until one can in truth say of the university tonight that there is no appreciable province in the dominion of the mind to which it is alien."

Lying deep in this intellectual firmament and gleaming like a flaming Orion, shines the medical school—now celebrating the 50th anniversary of its emergence into the galaxy of departments. You will, I know, guard its interests that it may grow into a stature exceeded by no other medical school in the world. I know I am expressing tonight the sincere sentiments of the medical alumni who once were inhabitants on this star, when I pledge you our continued loyalty, coöperation and interest.

To reminisce, I must confess that compared with the modern graduate in medicine, those of us who went from out of the department in what has come to be termed the "horse and buggy" days did not know much. But let me tonight say that those boys were the matchless spirits

who in their day did such kindly and faithful service under the most trying circumstances as to gain for the profession the well earned title, "The friend of man." Many of them lie tonight in the little cemeteries by the trails they travelled through blinding winter storms, no lights to guide them—only the inner light and the irrepressible spirit that drove the country doctor to do his job—when no other human being dared the night. Their meager medical training and their little medical kits may have seemed but small bastions against the adverse catastrophes they faced in those early days, but history will record to their everlasting honor that nowhere in life's trying situations have they been quite so large. They were an earnest and an answered prayer—and a fortress to countless homes and distant hamlets on frontier settlements where most of the boys went to administer.

"From the voiceless lips of those unreplying dead," I tonight bring greetings and words of gratitude to the medical school which was to them the source of the inspiration and the medical training that gave the faith and the competence they had to carry on. These heroes had little of the comforts in which the modern graduates wallow. They had no high-powered, palatial, enclosed, warm automobiles—only open buggies and sleighs—the sleet, the rains, and the pitiless blinding snows driving in upon them as they drove over trackless prairies. They had little practical laboratory knowledge, no hospitals near, no x-ray machines as we now enjoy. The days' and nights' experiences of those days, marooned and alone, haunt me like a nightmare to this day.

These early graduates were plain men, quite imperfect in training and equipment, but they answered the calls on wide fronts to face every form of disease and emergency—and because of the storms, often at the peril of their lives. They were plentifully bewildered, plentifully mired in medical ignorance as we know medicine today, but they did their job, their job went on in outer peace. They closed an epoch in the progress of medicine, not so impressive as now, but they need not be ashamed of the colors that they flew. They sleep tonight among our sacred dead. They upheld the best traditions of an honorable Guild.

Among those noble dead who lived those early days with high emprise, I am impelled to make special mention of one because of what he was and of what he wrought for his generation. I

have reference to Dr. Herman Johnson, member of the class of 1901, who died five years ago at Dawson, Minnesota—the scene of his earthly labors. I have not the time to etch him as I would like—only time to give you glimpses of this lordly man—beloved by every member of the medical profession of Minnesota and the entire Northwest, admired and respected by everyone who knew him. If the hierarchy of medicine ever elevated a man to sainthood, something which a few really deserve, the profession would by acclamation vote him the citation. Personally I would crave the honor of casting the first white ballot. His physique, his features, his leonine mane, his eyes when in conflict, his heart tender as a woman's when unperturbed, his loyalty to friend, his uncanny power of analyzing complex situations, his withering oratory when on fire, his hatred of sham and hypocrisy—these characteristics stand out in the memory of him.

He was a pioneer physician but his life-span bridged two epochs. He embodied in spirit and in practice all the virtues of humanity, charity, honesty, personal integrity, humility. He was a physician and a surgeon steeped in fidelity to the tenets of his Guild. He was fearless, capable, dynamic. In the early days out there on the western front, he drove out into the dark nights to minister, often to operate emergencies on kitchen tables with only candles and kerosene lamps to light him. His percentage of recoveries measured quite well up to that of the surgeon surrounded by all the accessories of the modern operating room.

He was to his community a wise counselor, to the sick "a pillar of fire by night," and by day, "the shadow of a great rock in a weary land."

His faith in individual medicine was to him an obsession to the last. Great student of human nature that he was, he realized that the regimentation of the noble Guild would eventually rob the individual member of his initiative, blast the soul out of the profession, tend to degrade it to a vulgar trade union, make the doctor a hireling

of the state and dominated by the mediocrity of a political pressure group. In his heart he prayed that the high profession of medicine would be saved from such degradation. And I know that I am voicing the sentiments of the alumni when I say "Amen" to his prayer. You will pardon the digression when I say that some day it may come to pass that you all may lose even your most cherished liberties that patriots through the centuries fought and died for. When there are enough alien-minded mongrels among us who cease to appreciate free speech, the free ballot, a free press, free enterprise and freedom to worship as the individual conscience dictates, we will soon lose the freedom that we have known and our fate will fall into the hands of merciless dictatorships with their bureaucratic rule. Then preachers will be told what to preach; teachers will be told what to teach; women praying to their God for themselves and their children will be destroyed—for the dictator will have no other God before him.

So devotedly and endlessly did this man fight for his profession against politics, charlatanism and quackery that the struggle so undermined his health that he died earlier than his time, a martyr to the cause of scientific medicine here and everywhere. He led the fight in the legislature of Minnesota to place upon the statute books the so-called Basic Science law—which has since become a model for a score of other states in the Union.

In closing, I wish to address him tonight "where beyond these voices there is peace" in the lines of Wordsworth:

Herman:

"Thou hast left behind
Powers that will work for thee.
There's not a breathing of the common wind
That will forget thee;
Thou hast great allies;
Thy friends are exultations,
Agonies
And love, and man's unconquerable mind."

VERTIGO*

W. T. WENNER, M.D.

St. Cloud, Minnesota

VERTIGO is a subjective sensation of disturbed equilibrium often accompanied by a slight clouding of consciousness. It may be manifested in the form of (1) giddiness, which is a mild degree of fainting with a momentary loss of one's balance; (2) a sense of rotation, either with objects rotating about an individual or an individual rotating about objects; and (3) a feeling of pulsion manifested as a veering of the individual to one side or the other. All of the above sensations appear in the form of attacks. They are not continuous or constant.

It is well to remember that patients frequently do not distinguish true vertigo from nausea and fainting, because vertigo may be associated with both.

Equilibrium in the human body is maintained by: (1) afferent impulses to the brain; (2) efferent impulses through the motor tracts and to the muscles; or (3) coördinating centers in various parts of the brain.

Afferent impulses come from: (1) superficial and deep sensibilities located in the skin, muscle tendons and joints; (2) visual impressions; and (3) the vestibular portion of the internal ear.

It is the vestibular portion of the internal ear or labyrinth that is the most important factor in maintaining equilibrium. All factors are not imperative to maintain equilibrium, but at least two are necessary for the purpose. When one factor is interfered with, the others compensate and carry on the function. For example, a blind man can maintain balance with aid of his labyrinth, muscle and joint sense; a tabetic will maintain his equilibrium through his vestibule and visual function; and a deaf mute, having no vestibular function, maintains his equilibrium with his remaining functions. Sudden loss of labyrinthine function by disease will cause very unpleasant vertigo for a while, but compensation takes place and the individual adjusts to it.

Any deviation caused by irritation or destruction of any of the normal factors concerned in maintaining equilibrium results in vertigo.

Etiologic Factors of Vertigo

First are those caused by general systemic conditions such as cardiac, renal, or arteriosclerotic pathology, pernicious anemia, leukemia, operating through disturbances of the labyrinthine circulation. Drugs like quinine, salicylates, alcohol and tobacco may be responsible. Infection due to teeth, tonsils or sinuses may be the offending agent. Gastro-intestinal disorders of which the gallbladder has the highest incidence may cause vertigo. Trousseau⁵ reports a series of cases of vertigo which he terms "gastrogenic vertigo," the earmarks of which are a direct relation to digestion proper and therapeutic response to dietetic and medical treatment. Analyzing his case reports, one is left with the opinion that many of his patients are the sufferers from gallbladder disease, which gives emphasis to this as a cause of vertigo.

In addition to the first group of causative agents such as general systemic factors are ocular conditions, diseases of the ear, and finally, diseases of the brain.

The following brief case report illustrates the gallbladder as a cause of vertigo:

A. H., male, aged thirty-six, a grocer, complained of low-grade temperature of three months' duration, gastric distress, frontal headaches extending to the occiput, attacks of vertigo associated at times with vomiting, weakness, and incapacitation for work. He was referred for refraction and checkup on sinuses.

The fundi showed tortuosity of vessels in both eyes. Error in refraction was negligible. The peripheral fields were normal. There was no nasal congestion and the sinuses were clear. Ears were normal. In the vestibular caloric tests the reaction time was well within normal limits: 40 seconds in the right and 45 seconds in the left. With these normal findings it was felt that ears, sinuses and eyes were not a factor, that there was no pathology in the cerebro-pontile angles, and that there was some general cause for the vertigo. The patient had a cholecystectomy done several weeks later with complete relief of all symptoms.

Ocular conditions causing vertigo are chiefly due to muscular imbalance, which increases when the gaze is in the direction of the paretic muscle. Occluding one eye will always relieve the vertigo. Poorly adjusted glasses, especially if the correc-

*Read at the Northern Minnesota Medical Association, Detroit Lakes, September 8, 1939.

tion contains a high cylinder or if the cylinder is at an improper axis, may result in vertigo. A person wearing bifocals for the first time may have a temporary vertigo until adjustment is made.

Aural Conditions Causing Vertigo

Pathologic conditions of the external auditory canal, such as foreign bodies or external otitis, may result in vertigo by increasing pressure or irritation of the ear drum. Middle ear catarrhal otitis media and blocking of the eustachian tube may also be a cause. Suppuration of the middle ear, acute or chronic, may cause vertigo by infection of the labyrinth. A sudden onset of vertigo, with nausea, vomiting and nystagmus, accompanied by a unilateral deafness without the presence of suppuration, has been described by Meniere as due to a hemorrhage into the labyrinth.

Brain Conditions Causing Vertigo

Intracranial lesions, such as tumors of the frontoparietal lobes, as well as those of the cerebellum, may cause vertigo. Weisenberg in his study concluded that vertigo in cases of brain tumor is caused by an increase in intracranial pressure, and that tumors of the posterior fossa are more likely to cause vertigo. He found no characteristic type of vertigo in any type of tumor and also found that tumors may exist without vertigo.

Trauma to the head may be followed by vertigo for an indefinite period due to cerebral concussion. This is important in industrial and civil cases. Vestibular tests may give some information as to malingering in such cases.

In certain brain conditions, such as multiple sclerosis and encephalitis, vertigo is a symptom in certain stages of the disease.

Diagnosis of the Etiology of Vertigo

Diagnosis of the cause of vertigo should be made only after a careful history and a complete physical examination to rule out any of the aforementioned systemic conditions, neurologic or cerebral diseases, and also aural pathology. An important measure in the diagnosis is the performance of the vestibular tests. This is a relatively simple procedure and can be performed by anyone. Even the interpretations are not difficult. The information received, whether negative or positive, is an invaluable aid. The rotation test requires a special chair, but the caloric

test requires only water, so it will be described in detail.

The importance of the caloric test is seen in the following case:

Mr. W., aged thirty-three, first presented himself in 1929 with the history of impaired hearing of the left ear of several months' duration. The Weber test was referred to the left ear. Bone conduction of the left ear was increased as compared with air conduction. He was not seen again until 1936, when he was referred for fundus examination. He then gave the history that for six months he had had attacks of vertigo and stumbled over objects. He had an old comitant convergence of the right eye. Visual tests demonstrated 20/50 vision on the right and 20/25 vision on the left side. Fundus examination showed a slight blurring of the upper and nasal disc margin of the left eye. He was referred to a competent neurologist, who found nystagmus to left, slight slurring speech, slight ataxia of left arm and leg, increased knee jerks grade +1 on left, and some impairment of deep pain sense both ankles. On these findings a diagnosis of multiple sclerosis was made and intravenous typhoid therapy instituted. He was seen by another neurologist several months later, at which time there was some improvement in his speech. His ataxia and loss of balance showed no change. Neurological findings were the same.

The patient was not seen again until February, 1937, at which time there was edema of the left disc and definite blurring of the right disc. Hearing of the left ear had markedly diminished. He was seen next in October, 1937, suffering from intense headaches. Examination then revealed total deafness of the left ear, left labyrinth functionless, marked reduction in vision, and bilateral choked discs. The spinal fluid was under markedly increased pressure. Operation demonstrated an acoustic neuroma of the left eighth nerve. The patient died twenty-four hours after operation.

Reviewing this unfortunate history, one is impressed with certain features. In the first place there was a long duration of symptoms, a period of nearly nine years. Undoubtedly the first symptom, impaired hearing, heralded the beginning of the acoustic neuroma. Further, failure to perform vestibular tests was responsible for the lack of information which would have made an earlier, correct diagnosis possible.

Two Methods of Caloric Test

1. *Koprak or Minimal Method.*—Use a 10 c.c. syringe and water at 55° F. Inject against the upper posterior part of the drum. Nystagmus appears in 15 to 25 seconds and lasts 60 to 100 seconds. The labyrinth is hyperactive when nys-

tagmus appears in 15 seconds or continues longer than 100 seconds.

2. *Mass douching* is probably more time consuming, but it is more satisfactory to study the vertigo and past-pointing. The technic is as follows:

- | | |
|--|--|
| 1. Douche the right ear with water at 68° F. and head 30° forward. | 1. Requires about 40 seconds of douching. Nystagmus will be to the left. Past-pointing will be about 8 inches to right with each hand. Sensation of turning to the left—tendency to fall to the right. |
| 2. After nystagmus and past-pointing have been quickly noted, bend head back 60° and note reactions. | 2. Same as above except nystagmus is horizontal. |
| 3. Repeat 1 and 2 in left ear. | 3. Same as in 1 and 2 but in opposite directions. |

The caloric method tests each ear separately, as well as the vertical and horizontal canals separately. With the head forward 30°, the vertical canals, and with the head backward 60°, the horizontal canals are tested. Sometimes during the course of these tests, varying with each patient, there is a certain amount of pallor, nausea and perspiration, which is a normal reaction of the sympathetic nervous system.

If all of the responses are present, either normally or more or less proportionately exaggerated or diminished, it means that both inner ears are intact, that there probably is not present any lesion in either of the cerebello-pontile angles, and that if any vertigo exists it is probably due to some general cause.⁴

Treatment of Vertigo

The literature on treatment of vertigo is both voluminous and varied, signifying that there is nothing specific for the malady. The treatment, of course, is directed toward the cause and its elimination when possible.

Brain tumors are neuro-surgical problems. Aural conditions, especially suppurative, are in most instances relieved by radical mastoidectomy. An aural condition frequently causing vertigo is a catarrh of the eustachian tube, the result of an

acute head cold, nasal obstruction, sinus infection, improper blowing of the nose, or exposure to a draught. Therefore, the first step in treating this condition is to procure the patency of the eustachian tubes, and the next step is to maintain it.

Atkinson,¹ in his study, states that "a large proportion of all cases of vertigo are due simply and solely to a unilateral eustachian obstruction, the cure of which will cure the dizziness. Eustachian catheterization is the sheet anchor, and not until it has been tried and failed or been proven not to be the cause of the symptom, should it be abandoned. As long as it improved, even if only temporarily, it should be continued."

Patients have been relieved of vertigo by removal of abscessed teeth or infected tonsils or cleaning up of a sinus infection. Gastro-intestinal disturbances and dietetic irregularities should be corrected. Circulatory conditions must be given proper attention. In a large number of cases, the cause is obscure and the attention should be directed to treatment of the attack, first principle of which is immobility, as the patient soon learns that the slightest movement provokes or aggravates vertigo. A quiet dark room more conducive to rest should be used. It is well to promote elimination by giving a mild cathartic. Sedatives should be given. The patient is usually vomiting, so sedatives are not tolerated orally. Three grains of sodium luminal subcutaneously or sodium amytal rectally are usually effective.

The treatment of Meniere's disease is directed not to the cause, as that is unknown, but to removing or reducing the liability to the attacks. Fatigue, worry, insomnia are factors aggravating or precipitating an attack of vertigo. The psychological aspect of the case, therefore, is important. These patients are usually of anxious temperament and need continued encouragement and regulation of their mode of living, such as adequate relaxation and avoidance of alcohol and tobacco.

The medical treatment recommended by Furstenberg³ and his co-workers opens a new approach to this problem, and should be instituted in all cases when one fails to discover and eliminate probable causes. It is based on the theory that the vertigo is due to a water-logged condition of the static labyrinth. The edema is not water alone, but a solution of electrolytes, chiefly sodium salts and water.

The therapeutic indications are: (1) to permit as small an intake of sodium as possible; and (2) to prevent the accumulation of sodium by the body. The first is easily attained by means of diet, and the second by the administration of acid producing salts, such as ammonium chloride. When these two factors have been controlled, the intake of water does not need to be considered, although excessive quantities of liquids should be avoided.

In the series reported by these authors, the following treatment was followed:

1. Proteins were unrestricted.
2. Calories were permitted as indicated.
3. A low salt diet was advised.
4. Ammonium chloride was given at the rate of 3.0 Gms. with each meal (6 capsules, each containing $7\frac{1}{2}$ grains, are taken during the meal) for three days and omitted for two days. The capsules should not be replaced by the chocolate-coated or the enteric-coated pills, because they sometimes pass through the gastro-intestinal tract without being absorbed. The ammonium chloride can be given in this dosage for an indefinite time without injurious effects.

In not one instance did the writers fail to

produce an attack by the administration of sodium, and not once were they disappointed in obtaining complete relief by the medical therapy above described.

When all attempts with medical therapy have failed, surgical procedure may be necessary to give some of these unfortunate people relief. Dandy² recommends surgical severance of the vestibular portion of the eighth nerve. Other surgical procedures recommended are destruction of the labyrinth with absolute alcohol.

Summary

1. Vertigo is defined.
2. Importance of vestibular testing is stressed.
3. Two cases are reported.
4. Furstenberg method of medical treatment is advocated.

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SYMPATHETIC NEUROBLASTOMA*

Report of Case

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SYMPATHETIC neuroblastoma of the left suprarenal gland was first described by Hutchinson in 1907.² Since then a few more cases have been reported and additional studies have been made regarding this condition. Neuroblastomas are neurogenic in origin and are found in the adrenal medulla or in the sympathetic ganglions along the spine. Neuroblastomas are also known as neurocytomas or sympathoblastomas. The metastases, which always occur early, appear in the retroperitoneal glands, the orbits and the long bones. The metastatic masses, which are firmly attached to the bone as in this case, contain many bony spicules. The primary tumor, which invariably involves the left adrenal gland, varies in size and is usually palpable through the

abdomen. In this case, the tumor was not palpable.

Microscopically, one sees a large number of round cells with hyperchromatic nuclei, fibrils arranged in longitudinal bundles or compact round balls, and imperfect ganglion cells. The round cells are arranged around these fibrils to form rosettes. The formation of rosettes by the round cells is a characteristic microscopic finding.

Most often neuroblastomas are seen in young male children, especially those under the age of four.

In sympathetic neuroblastoma, the patient usually complains of pain in the extremities, the back, or in the neck. The pain may be of a dull aching type or it may simulate pain found in rheumatic fever. The pain may be referred only

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to the thigh, leg, and spine or it may be general throughout the body. Movement of any involved part increases the pain. At times, an abnormal gait may be the first symptom. Attacks like this may last for a few weeks, subside for a while, only to recur again.

In some cases, pain in the abdomen leading to the discovery of a palpable mass⁴ will be the initial finding. Often swelling of the eyelids, or protrusion of the eyes may attract the attention of the parents. The face may also become involved due to metastases. Frequently, the eyelids are swollen and discolored. Protrusion of one or both eyeballs occurs and may be so marked as to cause necrosis. A gradual loss of eyesight is a common complaint. Leinfelder³ states that the ocular signs are caused by increased intracranial pressure and metastases to the orbit. Often nodular swellings are palpable on the skull. Swallowing or other movements of the jaw causes pain in some cases. Frequently a marked facial palsy is present. The patient may also complain of ringing in the ears and a gradual loss of hearing.

The glands, especially in the inguinal and the submaxillary region, are often enlarged and painful. This may be an early or late manifestation. Other clinical findings are a loss of weight and appetite, vomiting, marked emaciation and weakness, irritability, nervousness, fever, sweats, tachycardia, dyspnea, and incontinence of the bladder and bowel.

In early cases, x-ray examination of the bones usually reveals no pathological changes. In this case, no changes were noticed when the patient was seen by another physician. Later on, x-ray examination of the skeleton reveals interesting findings. Marked areas of intensive bone infiltration appear in the pelvis, femur, skull, and spine. The bones show a granular type of osteoporosis due to minute foci of resorption. The x-ray picture reveals an intensive and diffuse process of new bone formation and also destruction of bone. Doub¹ states that in many instances the resorption is of uneven density, suggesting a diffuse infiltration rather than a massive destruction. A striking reaction of the periosteum is its elevation with a diffuse infiltration of osseous tissue and the formation of fine spicules.

The blood picture shows a pronounced secondary anemia, a non-progressive erythrocytic re-

generative shift and considerable myeloid immaturity. The presence of myeloid cells makes it difficult at times to differentiate between the leukemias and neuroblastoma.

Neuroblastoma is a very mystifying disease to diagnose. It must be differentiated from the leukemias, especially the aleukemic leukemia, chloroma, Ewing's sarcoma, myeloma, hyperparathyroid disease, rheumatic fever, tuberculosis, and hypernephroma. Neuroblastoma must always be considered in young male children when pain in the bones, bulging of the eyeball, and abdominal mass are present.

The prognosis is hopeless. There is a rapid and downward progress which is only interrupted by some abatement of symptoms for a few weeks, followed by relapses and finally death within a couple of months. No treatment is effective. Radiation treatment offers only mild amelioration and at times prevents necrosis of the eyeball.

Case Report

The patient, a white boy of fourteen, was seen by me on February 7, 1937, complaining of rheumatic-like pain in the left shoulder, elbow, hip, and in the back. The patient first noticed the pain in the hip during the summer of 1936. The pain would last for a few weeks, then remain quiescent for a while and then was succeeded by a similar recurrence. The number of attacks gradually increased during the fall of 1936, preventing him from going to school. He began to limp and later needed assistance in walking. During the last three weeks he was bedridden.

Physical examination revealed a pale, undernourished and acutely ill boy. The pulse was regular, the rate was 130, and the temperature was 100. Both eyelids were slightly swollen but the eyeballs showed no protrusion. Examination of the chest revealed nothing of importance except a strong apical impulse. Abdominal examination was essentially negative. The extremities showed a slight wasting and the right leg was slightly spastic. Movement of the arm, legs, or back caused severe pain.

The urine was essentially negative. Blood count showed 3,000,000 red cells, 9,000 white cells, 42 per cent hemoglobin, and 0.6 color index. Blood smear examination revealed some anisocytosis and poikilocytosis, 3 juveniles, 44 stab cells, 24 segmented cells, 26 lymphocytes, and 3 monocytes. Later on some myelocytes appeared. The blood Wassermann reaction and Mantoux skin tests were negative. The blood sedimentation rate was greatly increased.

My first impression was rheumatic fever, but as the case mysteriously progressed with new symptoms and signs, rheumatic fever was ruled out.

The pain on the left side gradually subsided while the right hip and leg increased in severity during the next few weeks. It was noted also that the right leg was now flexed and externally rotated and the head of the right femur appeared to be displaced backward. These clinical findings suggested a posterior dislocation of the femur resulting from some undetermined bone pathology. The patient was able to enter the hospital on February 17, 1937, for further clinical investigation.

X-ray examination of the hip showed a posterior

dislocation of the right hip with formation of a new socket on the outer aspect of the ilium. The pelvis, femora, and the skull showed a granular type of osteoporosis and a diffused process of new bone formation. The periosteum was elevated, especially in the femora. Marked bony infiltration was also seen on the lower

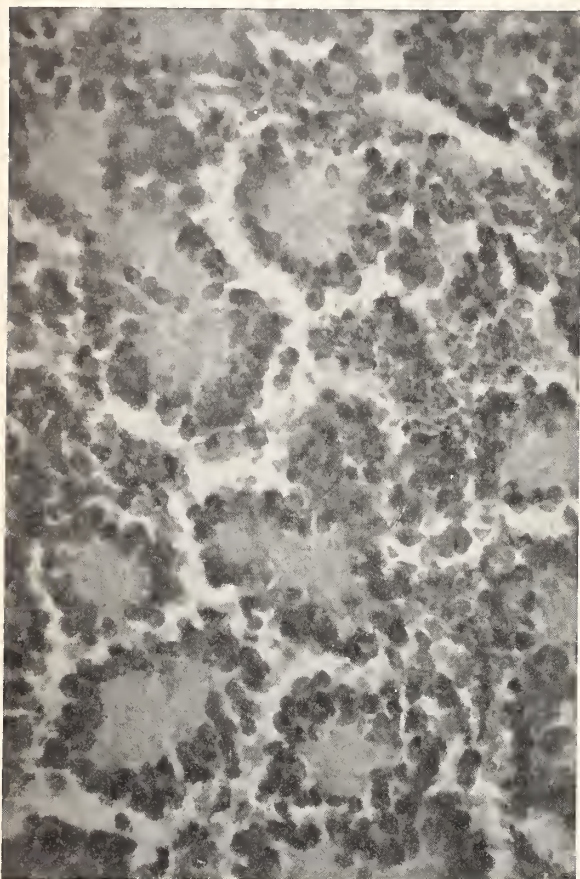


Fig. 1. Microscopic section of neuroblastoma involving left adrenal gland showing typical rosettes formed by round cells.

end of the left femur. A urogram showed no abnormal findings.

The course during the succeeding weeks was downward. Both eyelids began to swell and gradually the eyeballs became more protruded. There was pain upon swallowing and ringing in the ears. Some abdominal

pain was present but no mass was palpable. At this time, my impression was that of neuroblastoma of the left adrenal gland but hyperparathyroid disease had to be ruled out. The blood calcium was normal. However, such a finding frequently occurs in hyperparathyroid disease. To a certain extent the clinical manifestations definitely pointed towards neuroblastoma. But if an incorrect diagnosis of neuroblastoma had been made when really a hyperfunctioning parathyroid gland was the causative factor, it would have been regretful indeed, since removal of the enlarged parathyroid gland would give a good result.

A decision was made to explore the parathyroid gland, since there was nothing to lose and everything to gain by such an operation. The operation was performed by Dr. Dubbe and myself but no pathology was found. With this disheartening knowledge a definite clinical diagnosis of neuroblastoma was made and no hope for a cure was given to the parents. The patient was later seen at an outside clinic where a diagnosis of multiple central nervous system metastases possibly due to a hydronephroma was made.

During the summer of 1937, there was a progressive downward course. The eyes became more protruded than ever and blindness was nearly absolute. Diffused enlargements appeared on the frontal area of the skull. The coronal sutures were somewhat separated. The lower jaw was also studded with small round masses. The bowels and bladder were incontinent and the crest of the left ilium was enlarged. The patient gradually became weaker and he died on November 23, 1937. The illness lasted a year and four months.

Postmortem examination of the abdomen revealed rounded and flattened masses attached to the inner aspect of the left and right ilium. The mass on the left side was removed with difficulty and measured 6 cm. in length, 4 cm. in width, and 3 cm. in thickness. The mass was well encapsulated except for the portion which was attached to the ilium. Many bony spicules which were attached to the ilium projected into the tumor. The mass, which was smaller on the right side, was not removed. The lymph nodes along both sides of the spine were enlarged and bright red in color. The adrenal glands were normal in size. Sectioning of the left gland revealed a small irregular but well localized dark area about 1 cm. in diameter. The right gland showed no apparent pathology. Histological examination of the left adrenal gland and of a lymph node showed the typical rosette formation composed of small round cells (Fig. 1) which is found in neuroblastoma.

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DIAGNOSTIC METHODS IN UNDULANT FEVER (BRUCELLOSIS) WITH RESULTS OF A SURVEY OF 8,124 PERSONS

S. E. GOULD, Eloise, Mich., and I. F. HUDDLESON, East Lansing, Mich. (*Journal A. M. A.*, Dec. 11, 1937), describe briefly the performance and interpretation of the laboratory methods which at present are believed to be most useful in the diagnosis of undulant fever (brucellosis) and report some of the results of a survey of the incidence of brucellosis in a large county hospital. An unusual opportunity to study the incidence of *Brucella* infection presented itself at Eloise Hospital and Infirmary, whose milk supply was partly infected with *Brucella*. All persons in the institution were first tested intradermally with brucellergin. Among 8,124 persons tested, 845, or 10.3 per cent, showed positive brucellergin reactions. The incidence roughly paralleled the average length of stay in the various groups in the institution. The incidence was lowest among the hospitalized group (6.2 per cent), whose average stay was the shortest, and greatest among the mental patients (15.4 per cent), whose average stay was the longest. The brucellergin test was found to be the most sensitive test in the diagnosis of brucellosis. If the test is negative, brucellosis will usually be ruled out. If the test is positive, the opsonic test should then be performed to determine whether infection or immunity is present. A negative agglutination test does not rule out *Brucella* infection. The agglutination test is diagnostic only in a small percentage of cases and gives no information as to the immune status of the subject. Carriers of *Brucella* may be of some importance in the spread of the disease.

CASE REPORTS

PNEUMOCOCCUS (TYPE III) MENINGITIS WITH RECOVERY

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The mortality of pneumococcus meningitis is difficult to compute because of the lack of a large number of figures concerning its incidence. However, most authorities consider it almost universally fatal.² Tripoli¹⁴ reports 468 cases of purulent meningitis occurring in a ten-year period at the Louisiana State Charity Hospital with 111 (24 per cent) being due to the pneumococcus with but one recovery and that in the case of an untyped organism. At Boston Children's Hospital 74 (26 per cent) of a series of 284 meningitides were due to the pneumococcus with one recovery, that being a type XII organism.³ This high incidence has not been noted at Ancker Hospital, where in the past nine years only 5.5 per cent of the cases of meningitis were caused by the pneumococcus with only one recovery here reported. Neal⁴ found only sixty-six cases of meningitis due to this organism in 1,259 cases, and then (1920) considered the disease universally fatal. Shaffer,¹¹ in 1938, considered the disease as carrying a mortality of at least 98 per cent.

There are, however, numerous reports of recoveries from this infection in the literature. One hundred and eighty-five cures of all types of pneumococcus meningitis were reported prior to 1937 and in that year seven additional were reported.¹³ With the widespread use of sulfanilamide and related drugs since then, there have been increasing numbers of recoveries reported.

No special type of pneumococcus predominates as a cause of meningitis but the frequent occurrence of the Type III organism secondary to disease of the middle ear or paranasal sinuses is well known. Neal⁹ found it in thirty-five out of seventy-five cases of pneumococcus meningitis of otogenic or paranasal sinus origin. The organism was the cause of meningitis in only twelve cases of meningitis in a series of 139 caused by infections other than those mentioned. Neuman¹⁰ analyzing 101 cases of otogenic meningitis found the pneumococcus Type III organism to be the offender in seventy-two cases and other types the cause in sixteen.

In spite of this evidently large incidence of Type III pneumococcus meningitis, there have been very few recoveries noted in the literature, although this number is enlarging rapidly with the use of sulfanilamide and related compounds. Allmen¹ in 1937 found but four previous cures of the infections and to this added one of his own which was treated with subarachnoid drainage and radical mastoidectomy. Two of the patients received antipneumococcus serum alone, one ethyl hydrocupreine, and other case potassium permanganate enemas only. Gubner⁵ and Garfin³ reported re-

coveries following radical mastoid surgery and sulfanilamide therapy. Magruder⁸ had a recovery with sulfanilamide, myringectomy and subarachnoid drainage, as did Silverman.¹² Silverman's patient died after four months with a clinical meningeal reaction but no organisms in the spinal fluid. MacKeith⁷ had a recovery following remission when the drug was discontinued using M and B 693 (sulfapyridine) and this was apparently the first recovery from a Type III organism in which this drug was used.

In October, 1939, Hodes, Gimbel and Burnett⁶ reported seventeen cases of pneumococcus meningitis, with eight recoveries. They used sulfapyridine and also sodium sulfapyridine. Two of these cases of Type III pneumococcus meningitis were isolated.

Case Report

L. R., an eighteen-year-old young woman, white, was admitted to Ancker Hospital, Saint Paul, on November 21, 1939. She was very lethargic and semi-rational, being aroused only by loud and persistent questioning. She complained of severe headaches, and stiff neck and back. The history obtained from relatives revealed that seven days prior to admission she had developed a cold, followed five days later by pain in the right ear and generalized headache. Headache became steadily worse and purulent discharge from the right ear was noticed on November 19. The symptoms became progressively worse. On the day before admission she screamed several times and had emesis. No convulsions or paralysis were evident.

Past history revealed that the patient had had frequent colds and in 1938 had had acute purulent bilateral otitis media.

On admission the patient was very listless and did not respond well to questioning. She was well nourished. Her face was flushed and she appeared to be acutely ill. Temperature was 102.8, pulse 125, respiration 16, blood pressure 130/70. There was a purulent discharge in the right external auditory canal. Fundoscopic examination showed a slight papilledema of both discs. She was in opisthotonos with marked rigidity of neck and back. Kernig and Brudzinski signs were positive. The tendon reflexes were all positive. The spinal fluid was under increased pressure and heavy ground glass in appearance.

Admission Diagnosis: Acute suppurative otitis media (R); purulent meningitis.

November 21, 1939, 7:30 a. m.—Spinal fluid 15 c.c. pressure III, ground glass appearance. Leukocytes 7,800 (P.M.N. 86 per cent). No organisms found in direct smear. T. 102. P. 100.0, R. 16.

Smears made from purulent discharge from right ear were investigated thoroughly in an attempt to determine the bacterial cause of the meningitis. Many Gram-positive cocci were found but further differentiation was not possible during the first 24-hours. On the basis of clinical possibility sulfanilamide was or-

CASE REPORTS

dered and also 20 c.c. of polyvalent antistreptococcus serum was administered (intramuscularly). Headache controlled by codeine sulfate.

12:00 noon—T. 105.2. P. 128.

3:00 P.M.—25 c.c. spinal fluid removed.

10:00 P.M.—25 c.c. spinal fluid of ground glass appearance. Pressure 425 mm. Headache improved.

Blood examination: Hemoglobin 65 per cent—R.B.C. 3,340,000; W.B.C. 28,300; P.M.N. 92 per cent; Lymph. 8 per cent.

Urinalysis: amber; acid; sp. gr. 1.030; heavy traces of albumin.

Transfusion 200 c.c. of blood and 500 c.c. of normal salt solution were administered intravenously.

November 22, 1939.—T. 103.6. Severe headache. Some cough. Chest finding negative. Spinal fluid, 25 c.c. Pressure, 300 m.m., 2,670 leukocytes.

Laboratory Report: Type III pneumococcus found in cultures of first spinal fluid obtained.

Therapy changed. Sulfanilamide discontinued. Sulfapyridine administered, two doses of grains XXX each at four-hour intervals and then grains XV q.4.h. accompanied with equal amounts of sodium bicarbonate.

Transfusion—250 c.c. blood, 400 c.c. n.s.sol.—intravenously.

7:15 p. m.—80 c.c. of 5 per cent sodium sulfapyridine solution (60 grains) administered intravenously. Patient had emesis following this injection and emesis continued at intervals for thirty-six hours.

9:15 p. m.—Spinal fluid 30 c.c. slightly cloudy. 3,600 leukocytes (P.M.N. 83 per cent).

A consultant otologist recommended paracentesis of the right ear drum to increase drainage. This was performed. The question of immediate surgery of the right mastoid bone was considered. Although there was some tenderness over the mastoid body, conservative management was decided upon.

November 23, 1939—12:01 a. m.—T. 100.

40 c.c. 5 per cent sodium sulfapyridine (30 grains) administered intravenously. Emesis.

7:00 a. m.—40 c.c. 5 per cent sodium sulfapyridine (30 grains) intravenously. Free sulfapyridine 17.3 mgm. per 100 c.c. of blood.

3:00 a. m.—Spinal fluid 15 c.c. Leukocytes, 572.

Therapy: Sulfapyridine gr. XV, given per os q.4.h. x 6.

November 24, 1939, 1:00 p. m.—T. 102. Spinal fluid 15 c.c. almost clear. Leukocytes, 218.

Transfusion, 250 c.c. blood, 500 c.c. n.s.sol.—intravenously.

Sulfapyridine blood concentration, 10 mgm. per 100 c.c.

November 25, 1939.—T. 102. Definite improvement. Spinal fluid, 15 c.c. Leukocytes, 138. Sulfapyridine blood concentration, 8.0 mgm.

November 26, 1939.—T. 101. Some headache. Sulfapyridine blood concentration, 7.3 mgm.

November 27, 1939.—T. 102.2 Increase of headache. Spinal fluid 25 c.c. almost clear. Leukocytes, 50.

40 c.c. 5 per cent sodium sulfapyridine (30 grains) intravenously.

Transfusion—250 c.c. blood, 500 c.c. n.c.sol. + 5 per cent glucose.

Sulfapyridine blood concentration, 9.3 mgms.

Sulfapyridine spinal fluid concentration, 5.0 mgms.

November 28, 1939.—T. 101. More responsive, clear mentally.

Transfusion—blood 250 c.c., 5 per cent glucose in n.s.sol. 500 c.c.

Sulfapyridine blood concentration, 7.3 mgms.

Betaxin, 1 c.c. subcutaneously b.i.d.

Lextron, 2 caps. t.i.d.

Urine, albumin ++.

November 29, 1939.—T. 100.8. Spinal fluid 15 c.c.; clear; 35 leukocytes. Urine, albumen + (thereafter

urine was normal on all examinations. No red blood cells reported at any time).

December 1, 1939.—Mentally clear. Very little stiffness of neck.

Sulfapyridine blood concentration 8.3.

Sulfapyridine dosage reduced to grains X q.4.h. x 6 Hemoglobin 59 per cent. White blood count, 13,050.

December 14, 1939.—Spinal fluid 20 c.c., clear. Seventeen leukocytes.

Cultures of spinal fluid show no growth.

Sulfapyridine spinal fluid concentration, 3.4 mgm.

Sulfapyridine blood concentration, 5.4 mgm.

Blood sugar, 156 mgm. per 100 c.c.

Spinal fluid sugar, 52 mgm. per 100 c.c.

Blood calcium, 13 mgm. per 100 c.c.

P. S. P. test—61 per cent in two hours.

Dosage of sulfapyridine was gradually reduced to gr. X b.i.d.

Patient was discharged from the hospital on December 24, 1939, at which time she was free from evidence of disease. On January 8, 1940, she continued to remain well and was permitted to return to her home out of town.

In a discussion of this case the following considerations are worthy of mention:

1. Early diagnosis of the bacterial agent causing purulent meningitis. At the time of the *first spinal drainage* steps should be taken toward diagnosis of the causative organism. This calls for active coöperation and skill on the part of medical and laboratory staff.

2. Recovery in this case, in all probability, depended upon the early and sufficient administration of sulfapyridine and its sodium salt. The blood concentration of the drug during the first days was high. The amount of drug lost by emesis is not known. In the presence of a disease which has a fatal expectancy, chemotherapy should be carried out energetically.

3. Apparently the only symptom of sulfapyridine toxicity was the vomiting. Administration of intravenous blood and saline solution may have played its part in protecting against more serious toxemia. Frequent studies of blood and urine permitted us to observe the patient's response to the drug.

4. The decision to adopt conservative treatment of the evident right mastoiditis depended upon (a) the fact that intravenous sodium sulfapyridine was available and being administered and (b) that reports from the literature⁶ advise against surgical interference in like circumstances.

We express appreciation to Dr. W. W. Spink of the University of Minnesota for the supply of sodium sulfapyridine which was made available for our use in this case.

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SUBDIAPHRAGMATIC ABSCESS*

Report of Case

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The patient, a married woman of forty-seven, complained of a pain in the right abdomen on my first visit, October 26, 1935. She talked constantly in a rambling sort of way due to the fact she had been recently drinking gin and not eating food.

On examination there was a marked tenderness over the gall-bladder region but the abdomen otherwise was normal and the chest was normal.

A few days later the sclerae were jaundiced and she developed hallucinations, seeing fantastic objects in the room. She was then sent to the hospital, where we found the leukocyte count 12,000; temperature 101, and pulse 110. The pupils were pin point in size at this time as well as at my first visit. The Widal reaction was negative. The Schilling test showed a degenerative index of 50. The right posterior base of the chest was then dull and the x-ray examination showed a right lower lobar pneumonia.

During the following month her condition became gradually worse. X-rays of the chest were made repeatedly and showed an increase in density in the right chest, but whether this was above or below the diaphragm was uncertain. The heart was pushed to the left. There was a generalized edema of the whole back. The abdomen became distended, tympanitic and showed the presence of fluid. A lower lobe pneumonia then also developed in the left lung.

The leukocyte degenerative index rose to 73. Blood chemistry values for creatinine, urea and urea nitrogen were normal. At no time was the cough a distressing symptom. The patient took nourishment well and had good elimination.

On November 28, 1935, something happened. She developed a nausea and vomited. She then became dyspneic and had cold perspiration with the pulse up to 134 and respiration of forty. Severe pain developed in her upper right abdominal quadrant.

The next day a re-ray of the chest was made, which showed that the right diaphragm was raised to the level of the sixth costal interspace. The heart was markedly displaced to the left, the apex being pushed to the left chest wall. The outline of the right diaphragm could be made out 7.5 cm. higher than the left. Above the diaphragm was still unresolved pneumonia and some fluid. The x-ray diagnosis was, besides the pneumonia still present, fluid under the diaphragm, a subphrenic abscess.

Operation.—On November 30, 1935, under spinal anesthesia (spinoan 1.5 c.c.) a three inch incision was made just below and parallel to the costal border. Upon entering the abdomen considerable free fluid was found. The upper surface of the liver presented with no sign of intestine, stomach or omentum. The high position of the diaphragm, according to the x-ray, and the low position of the liver indicated there must be a marked interposition of fluid between the liver and the dia-

phragm. With a syringe and needle we punctured the area above the liver and got some cloudy fluid, which was cultured. (This revealed pus cells and after a week the culture showed a micrococcus tetragenous.) With blunt dissection we broke through some adhesions above the liver to be met with a gush of at least 500 c.c. of fluid. After the release of this fluid the liver immediately receded upward to its normal position and now we were able to visualize the gallbladder, which was very large and acutely inflamed. The gallbladder was opened and contained thick inspissated bile and five small gallstones. A rubber tube drainage was established. Two drains were placed above the liver and the incision was closed.

Postoperatively the bile drainage was satisfactory. Her temperature ranged from normal to 101° and her condition was considered fair.

On the ninth postoperative day a pyocyanous infection developed which was quickly corrected with boric acid powder.

The patient continued to improve and left the hospital on December 30, 1935. The bile drainage stopped ten days later. She continued to run a fever for twenty more days. Recovery followed and an x-ray taken on May 27, 1936, showed the diaphragm in normal position.

Discussion

This case proved of interest from a diagnostic standpoint. There is no question but that the alcohol consumption was beyond moderation and left its damaging influence upon her resistance. With a marked icterus of the sclerae, a dark brown urine and upper right quadrant pain, gall-bladder disease was obvious, but operation could not be considered because of the delirium present. The first improvement came in three days when her delirium cleared, but this was immediately followed by a pneumonia of the right lung base without a chill or cough, soon followed by a pneumonia of the left base. During her whole illness she exhibited so little cough that there was no suspicion of pneumonia. The cause for the persistent pin point pupils during the first week of illness was obscure as she denied having taken any drug, and the pupils remained pin point for days in spite of the abstinence from all opiates. Here we have a number of lesions above and below the diaphragm, consisting of a peritonitis, ascites, cholecystitis, cholelithiasis, subphrenic abscess, right pleuritis, right and left bronchopneumonia. This constitutes an extensive involvement in which mortality is high. It would seem that the forerunner of the process was the cholelithiasis. Whether a stone had passed through the cystic and common duct is of no great moment, but there was a cholecystitis of low grade, with a cystic-duct obstruction. The icterus was caused either by a temporary common-duct stone obstruction or a cholangitis. There was no common duct stone palpable at operation and there has been no gallstone attack since, a lapse of over four years. Up to this point we frequently see this clinical picture. The enigma begins here. The gener-

*Presented before the Saint Paul Surgical Society, January 13, 1938.

alized tender abdomen with a moderate tympanitis was confusing. Although we were dealing with a peritonitis yet there was no peritonic ileus. In five days the icterus cleared and the urine cleared, yet the peritonitis and the blood picture indicated an increasing toxic state as shown by the increase from 50 to 70 toxic cells in the Schilling test.

Now the drama scene changes. While we were watching for the mental bewilderment to clear up, by giving food instead of alcohol, bronchopneumonia of both lung bases developed. This continued for weeks with the temperature never rising over 103. She was in a delirium the greater part of the time. Although at times there was a low urine output of 200 c.c. a day, normal blood chemistry values were reassuring.

After two weeks the scene again changed. The abdomen, instead of being tympanitic, had a dull note and was large. A water impact was present. Elimination was satisfactory. The development of the ascites was concomitant with the rising of the density level in the chest x-ray. But why? What was the process? Then suddenly after exactly one month in the hospital, a turn to the worse occurred. There had been no cough, cyanosis or difficulty in breathing, and the patient had taken nourishment well and had been having no pain of any consequence. Then followed a severe pain in the upper right quadrant, nausea, vomiting and a marked dyspnea. There was outspoken resistance over the gallbladder region. A re-ray now showed the density level extending one rib higher, near-

ly to the sixth rib. Because we found only a small quantity of sterile fluid at a former needle puncture of the chest, we agreed with the diagnosis of the x-ray department of a subphrenic abscess. Spinal anesthesia was chosen. Anesthesia was perfect, although we were operating high at the diaphragm. The incision was very short and parallel to the costal margin, giving us full benefit of the incision length. It was a rare picture to see the dome of the liver presenting in the incision and none of the usual abdominal contents. Much of the ascitic fluid of the abdomen escaped as we were studying our plan of attack. It then became clear that this imprisoned fluid above the liver was a part of the general peritonitis. For weeks, adhesions had been forming and had very successfully divided the abdomen from the area between the liver and diaphragm. The impounded peritonic fluid above the liver was now our subphrenic abscess. After the evacuation of the fluid, the field has entirely changed. The very distended gallbladder, the origin of all the trouble, demanded attention despite our anxiety to do little because of the bilateral pneumonia. Although the incision was very short, yet we could readily do a drainage operation. Some questions remain puzzling. Was the pneumonia an extension by lymphatics from the abdomen or was it due to the usual cause of upper respiratory infection? Why should there be a general peritonitis when we did not find any gallbladder perforation? Although convalescence was slow for five weeks, the patient completely recovered and has remained well.

VOLVULUS OF THE CECUM, A POSTOPERATIVE COMPLICATION*

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Complications of any type may occur in the period following abdominal operations. Intestinal obstruction, both acute and subacute, referable to a variety of causes, will occasion severe apprehension on the part of the surgeon. Adhesions or inflammatory conditions subsequent to abdominal surgical procedures account for the majority of interruptions of intestinal continuity. Response to conservative treatment, emphasizing the principles of intestinal intubation as outlined by Wangenstein and others, is exceptionally effective in many instances of complete or incomplete occlusion of the intestine.

Obstruction of the bowel, referable to rarer etiologic agents, also may occur and, as far as the colon is concerned, volvulus may occur in either the sigmoid flexure or ileocecal region. This accident seems to occur when an exceptionally long mesentery is present, the sigmoid being involved much more frequently than the cecum. When a section of bowel undergoes rotation around its mesenteric axis, or occasionally around its own axis, an isolated loop is formed with obstruction at both ends. The vessels supplying the region are also compressed to a varying degree. In addition, increasing distention of the loop causes further impairment to the blood supply by compression of the capillaries. There also is present increased permeability of the intestinal wall and anoxemia, necrosis, and gangrene

are the end-results, unless there is early surgical intervention.

Postulating that an elongated mesentery is present in the right half of the colon, volvulus of the cecum may occur with the twisting in either direction. The direction of the twist depends to a large extent on the degree of mesenteric development present. When the cecum, ascending and part of the transverse colon are found to have a mesentery common with the small bowel, the rotation is usually in a counterclockwise direction. Of fifty cases collected by Faltin, the rotation in thirty-five was counterclockwise and was clockwise in only fifteen. When more development is present and a greater amount of the colon distal to the cecum is fixed, rotation occurs in a clockwise direction more frequently. The displacement of the cecum will depend on the length of the mesentery. At operation, the greatly enlarged distended cecum may be found in any portion of the abdomen, even in the left upper abdominal quadrant.

In acute torsion, the sequence of events is rapid. Pain of a crampy type, rather severe in nature, which is more or less localized in extent, is present. Early tenderness, marked constipation, occasional shock and rapid localized distention are found.

Such a picture, presented during postoperative convalescence, recently has been observed at The Mayo Clinic.

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Report of Case

Case 1.—A woman, aged fifty-three, had suffered from intermittent attacks of severe upper abdominal pain of colicky character for ten years. Clay-colored stools had been noted, but there was no history of jaundice. The colics had not been severe for two years prior to registration at the clinic. A qualitative food distress appearing especially after ingestion of fatty foods had been constantly present. Results of physical examination were normal save for moderate diastasis recti and a small umbilical hernia. Pelvic examination revealed a relaxed perineum, a lacerated and slightly eroded cervix, and a retroverted uterus.

Roentgenographic studies of the gall bladder, following the administration of dye, showed the organ to be non-functioning and to contain stones. The abdomen was explored through an upper right rectus incision with the patient under the influence of spinal anesthesia. The gall bladder showed chronic inflammation, contained stones, and was removed. The pancreas, stomach, duodenum, and appendix were explored and were considered normal. The uterus, enlarged to about four times normal size, was in a position of retroversion.

Convalescence of this patient was without incident until the evening of the fourth postoperative day, at which time she complained of mild lower abdominal pain. Examination of the abdomen revealed no abnormalities. She was examined at frequent intervals during the following four or five hours. Five hours after the onset of symptoms the patient's distress became increasingly severe and the pain, at this time cramp-like in character, seemed extremely severe. A distended mass was found in the lower portion of the abdomen to the right of the midline. The body temperature was 99° F. (37.2° C.). The pulse was only slightly elevated. Catheterization was carried out to rule out the possibility of a distended bladder. Volvulus of the sigmoid was considered likely and preparations for operation were made.

A low midline incision was made and on opening the peritoneum, a large amount of serosanguineous fluid escaped. The cecum was markedly enlarged and was free. Volvulus, including the terminal portion of the ileum, cecum, and part of the ascending colon, was present, with torsion amounting to two complete turns in a clockwise direction. Embarrassment of the circulation to the twisted bowel had progressed to such degree that the bowel appeared gangrenous. The cecum, purple in color, had exceedingly thinned walls and one of the longitudinal bands had ruptured. The most conservative procedure seemed to be exteriorization of the entire volvulus and this was done. Clamps were applied to the normal part of the colon distal to the volvulus, and to the ileum proximal to it, and the twisted bowel was amputated by cautery. Twenty cubic centimeters of coli-bactragen was poured in the peritoneal cavity and the abdominal layers were closed around the exteriorized loops of bowel.

Therapeutic aids employed during the immediate postoperative course included a transfusion of blood and the placing of the patient in an oxygen tent. The

ileum was punctured immediately proximal to the clamp twelve hours postoperatively. The patient, rather ill for a period of a week, made an excellent recovery.

Subsequently, the spur between the loops of ileum and colon was destroyed by means of clamps, and closure of the fecal fistula was carried out four weeks postoperatively. On final dismissal of this patient six months postoperatively, the wounds were healed except for a small amount of discharge at the site of closure of the intestinal stoma.

The mortality accompanying volvulus of the cecal region is reported to be high. Chalfont was able to collect 118 cases and he added one of his own. Twenty-three of the patients were not operated on and all twenty-three died. Of the remaining ninety-six who were subjected to some type of surgical procedure, fifty-seven, or 59 per cent, died. The total mortality, both operative and non-operative, was 67 per cent.

When the condition occurs as a complication following a recent operative procedure, the mortality necessarily would be expected to be somewhat higher than if volvulus had occurred primarily. Only two instances of torsion of the ileocecal region following an operation have been found in the literature. In the case reported by Nelson, in which volvulus occurred on the fourth day after a pelvic operation, untwisting of the bowel and performance of cecostomy on the tenth day resulted in cure. Likewise, the patient of Jellinghaus recovered after reduction of volvulus on the sixth day following cesarean section. The condition had occurred on the previous day. It is unusual that these two patients and the one reported in this paper all recovered.

A careful follow-up in the postoperative period of any operation is extremely necessary. With the advent of symptoms suggesting interruption of intestinal continuity, proper treatment must be instituted immediately. A fortunate result attended such therapy in the case reported herein.

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HISTORY OF MEDICINE IN WINONA COUNTY

WINONA City was called Wabasha Prairie in 1852. It was not a town, but merely a favorable town site, which had been used until the year before as an Indian camping ground. Of the few buildings there, Goddard's was the best known, the most popular and commodious. Settlers considered themselves fortunate if they could get in at Goddard's during the sickly season, for they felt sure of kind attention and watchful nursing on the part of Mrs. Goddard. The extremely high water of the early spring was followed by low water accompanied by hot and dry weather. This occasioned a general epidemic of severe forms of malarial disease which in many cases was fatal. Wabasha Prairie and the colony at Minnesota City were seriously affected by it, and there were no physicians there at the time.

All summer the heat and drouth continued, and the miasma which spread from the sloughs and large marshes in the immediate vicinity of Minnesota City rendered that locality particularly unhealthy. Serious bilious diseases afflicted the settlers, who, coming for the most part from the eastern states, were unacclimated and lacked the protection of suitable dwellings. A large majority of them were incompetent and unsuited for pioneer life.

Domestic treatment and patent medicines were generally depended upon. One of the colonists was attacked with intermittent fever, for which a neighbor recommended quinine. A friend who had business in Saint Paul was asked to procure a pound or two. Upon his return, the astounded patient received but four ounces and a bill for twenty dollars. After strongly condemning the Saint Paul druggist, he called in his neighbor who had prescribed the medicine. The explanation followed: It was a dram or two he had recommended instead of a pound or two. The sick man, relating the incident, said: "I knew nothing about the stuff. Anyway, it was no serious mistake because it was needed in the settlement and the neighbors took it off my hands without any pecuniary loss."

Every settler in that colony was said to have suffered from an attack of fever and ague. Only fourteen deaths occurred there in 1852, however, and a majority of these were juvenile cases.

A case of what was supposed to be cholera was reported in May, 1852. William Christie came down from Minnesota City, or Rollingstone as it was then called, to meet a new settler who was to arrive at Wabasha Prairie. On his way he forded the back slough, and without changing his wet clothing lay down to rest, complaining of not feeling well. He was taken with cholera and died before morning. Immediately following this, another death occurred at Minnesota City, which was also said to be cholera.

It was estimated by an early settler that the population within the present limits of Winona County on the first day of January, 1853, was about 350. Drs. Bentley, Balcombe, and Childs had come to the county before the close of 1852, so the rapidly increasing population was not entirely without medical attention at this time. However, Childs probably never practiced his profession, but engaged in the mercantile business for a year or two at Wabasha

Prairie. Balcombe came on an exploring trip in 1852 and again in 1853. The next year he built a house on his claim and lived there until his death in 1856. Apparently Balcombe had no intention of establishing a medical practice at Wabasha Prairie. Although poor health prevented him from being prominent, he took an active interest in the development of that part of the territory and in the political questions of his day. A contemporary said that he was a man of the most extended information of any among the early settlers and one of the first and best of the early citizens.

Dr. Bentley spent the winter of 1852-1853 at Minnesota City, then made his permanent residence at the town that is now Utica. There he became postmaster and justice of the peace. The postmaster's job entailed putting the mail in an old trunk where it was available to whoever wished to sort it out; and being justice of the peace was not much more exacting. A marriage ceremony performed by Bentley in 1857 was typical of his easy way of doing business. The principals were ordered to stand up and join hands, then the doctor said, "By virtue of the authority vested in me by the territory of Minnesota, I pronounce you man and wife." Considering the lightness of his other duties, there must have been ample time for him to practice his profession, but it is doubtful whether he made the most of it.

The first permanent, practicing physician in Winona County was Dr. James M. Cole, who arrived in Winona in 1854, and remained there forty years. He had finished his medical education eight years before in New York state. He was always a respected family physician and a substantial citizen, and served as a member of the school board, as city and county physician, and as a member of the legislature. He was also a prominent Mason and Odd Fellow.

Dr. Cole ran a livery stable during the depression of 1857, but he gave it up after four years. Accompanying his new card which appeared in 1862, the editor of the local paper published an article which reads as follows:

"The attention of persons in need of medical attendance is directed to the card of Dr. J. M. Cole elsewhere. He is a pioneer of this place, and in an extended practice and strict attention to his profession has been able to learn the peculiarities of this climate and the wants of invalids. Volunteers' families will find his name among physicians who offer gratuitous service."

The year 1855 marked the beginning of the period of Winona's growth. During the summer several newspapers began publication in Winona City, and printed the cards of newly arrived physicians, notably those of Norton, Chambers, and Farrington. Dr. J. C. Norton, physician and surgeon, justice of the peace, land surveyor, and coroner, resided at Homer.

Farrington, who settled at Winona City, announced in his card that he was prepared to attend to all calls within the village or country and also that he would pay particular attention to diseases of the eye. However, Farrington stopped practicing. After engaging in the hardware and later the drug business, he again took up his profession at Huron, Dakota Territory, in 1880.

In the year 1856, after the territory lying west of Winona had been opened to settlement, Winona grew considerably. Nine physicians practiced there at the time. The combination of the drug business with the practice of medicine was frequently found to be profitable. Dr. Chambers engaged in wholesale and retail drugs from the time of his arrival, and so did Dr. D. Ferris, who came in 1856. A newspaper article of that year gave a good description of the druggist's stock.

"We called on our friend Dr. Chambers the other day, and he laid before us a dish of fresh honey, the first we have seen in Minnesota, and the most palatable we ever tasted. Those who are fond of luxuries will do well to call and get a portion before the rapidly disappearing stock is exhausted. The Doctor has a most extensive stock of Drugs and Medicines—rare fancy articles for the toilettes of the sex divine, and some splendid Manilla and Spanish Cigars for the lovers of the grateful weed."

Evidently the drug business has seen considerably less change in the last century than has the practice of medicine.

Those physicians who thus established themselves in business were infinitely more fortunate than those who met the depression of 1857 with only their practice as a means of livelihood. Although the locality was growing rapidly, nearly every physician was forced to engage in some other business. Dr. Farrington started a hardware establishment; Drs. Moore and Sheardown, arrivals of 1856, became a jeweler and a baker, respectively, and Dr. Cole, as has been remarked, ran a livery stable.

These conditions continued for nearly three years. Eight or ten new physicians came to the county early in 1857, but few had the courage to come in fifty-eight and fifty-nine. During this time, patent medicines and guides to longevity were rife, although it is impossible to say how extensively they were used. Neighbors recommended cures for one another such as cranberry poultice for erysipelas, strawberry leaves for diarrhea, or horse-radish applied to the wrist over the pulse for immediate cure of toothache.

Reports often came in of typhoid and scarlet fever in surrounding localities. At the town of Winona, however, there were but four deaths in the year 1858 among a population of about 3,500. Public health and safety were early considered in Winona, which was an unusually well ordered town from the start. Drs. J. D. Ford, C. B. Dayton, and D. C. Patterson were appointed members of the board of health, which was an active organization in 1858. A year later, the following notice was circulated:

"The undersigned, Overseer of the Poor in Winona County, will receive proposals from Physicians for medical attendance upon the poor of said county during the twelve months next ensuing. The lowest responsible bidder will be entitled to the office of County Physician.

GEORGE W. PAYNE."

The physicians were among the civic leaders in the early days. Dr. John D. Ford especially may be mentioned. Ford was a graduate of Dartmouth College and of the Jefferson Medical College (1844). Soon afterward he commenced the practice of medicine at Norwich, Connecticut, where he attained a high position in his profession. After practicing successfully for about eleven years, he sought a climate more congenial to his health, and in 1856 came to Winona. For a time he resumed his practice, which became very extensive. Almost immediately he showed interest in civic affairs and was elected alderman of the ward early in 1857. The same year he became chairman of the trustees of the school districts, and later a director of the state normal school, and one of the county school examiners. He might well be called a pioneer in the interest of the common school system of the city and state.

Not long after his arrival in Winona, Dr. Ford became the agent of several eastern insurance companies, and gave up the steady practice of his profession, which was difficult for a man in poor health. Through his death, which came November 5, 1867, from typhoid pneumonia, the community lost one of its most valuable members.

At the county Democratic and Republican conventions, physicians were in constant attendance, and they were very often appointed to public office. Dr. S. B. Sheardown, among these, came to Winona City in January, 1856, and became a partner of Dr. Cole. Later, after serving in the Civil War, he took up his residence at Stockton. His interest in the development of the village and in its religious and educational growth well qualified him for public office. Twice he was elected to the lower house of the State Legislature and once to the Senate. At various times Dr. Sheardown had an office in Winona City. He also made the first attempt to establish a hospital there. However, his Stockton practice was very heavy and constantly called him back.

Dr. Sheardown was one of the charter members and the first president of the Winona County Medical Society, which was organized in April, 1869. Twice again he served in the same capacity. He died in 1889 while holding this office. At that time he was also treasurer of the State Medical Society, an office he had held for twenty years.

Dr. J. Q. A. Vale of Homer came to the county a few months later than Sheardown. He also was an active Republican and held many public offices, among them that of town clerk and state senator. He was a charter member of the Winona County Medical Society and in 1870 was elected to the Minnesota State Medical Society.

After 1860 the economic depression was alleviated and many physicians supported themselves by their practice alone. There were doctors at Homer, Minnesota City, Beaver, Utica, Rollingstone, and probably elsewhere; but Winona physicians were often called out of town to attend patients in the county. It was a business convenience for two doctors to form a partnership, keeping an office together and having accounts in common. In this way one would always be available in town while the other attended country patients.

The Civil War called many physicians into service in the early sixties. Dr. Dixon of Saratoga, and Drs. Wedel, Sheardown, Mead, and Trenkler of Winona all gained practical experience in the army and returned to practice again after their military service.

Minor epidemics visited the locality in these years. Diphtheria was reported across the river in 1861; measles was prevalent in 1862, and in the same year several deaths from scarlet fever were reported. The following note appeared in the press in 1863:

"That dread-inspiring disease, diphtheria, is said to exist in town to a considerable extent, and several cases have of late resulted fatally. The disease is not a new one. It has been known to the medical science for upwards of 200 years. If a case gets under headway, it cannot be easily overcome by any medical application; and a preventative has been used with good result in places where the disease was prevalent. The German physicians advise the gargling of the throat, every morning before eating and every evening before retiring, with the brine of Holland herring, which can be procured at almost any German grocery. This as a preventative to the spread of disease is recommended on high authority, and in the present emergency it might be well for every parent to take this simple precaution, especially with children going to school."

One may suspect the newspaper editor of having just received the commission for a large advertisement from the German grocery. Nevertheless, diphtheria continued to prevail throughout the county; one family lost six children in the space of thirty-six hours. Occasional cases of typhoid in the county were reported from year to year, but the disease did not become epidemic in any particular locality. Sickness usually occurred at Winona in the month of July, and was

popularly thought to be caused by the excessive warm weather and the imprudence of the people in eating green vegetables.

Unusually warm weather nearly always produced sickness in Winona. The fall of 1865 saw much disease of a bilious character which yielded easily to medical treatment. Spotted fever, a particularly fatal complaint, was epidemic at the same time and several deaths occurred at St. Charles.

Dr. Franklin Staples, who arrived early in the sixties and shared an office with Dr. Ford, was one of the best liked physicians in Winona, and was well known throughout the county. Especially were his services sought in cases of injury where skill in surgery was necessary. As a man of culture and ability, Dr. Staples was an asset to the community. A lecture given by him under the auspices of the Young Men's Literary Society was entitled "The Old Earth." The breadth of subject doubtless presented few difficulties to him for he had served for five years as the head of a boys' school and later as assistant professor at the Maine Medical College. As early as 1865, he was given the position of superintendent of city schools, but he resigned from the office on account of pressing professional duties.

The practice of medicine reached two extremes at this time. There were the well educated men, and those who had gained surgical skill and knowledge in the war; on the other hand there was the worst kind of quackery. Eye and ear doctors with sure cures, many testimonials, and much advertising were numerous in the sixties. Many of the early druggists used the title of "doctor" and probably dispensed as much advice as medicines. There were about thirty physicians in Winona City in 1865 and twice as many in the county as a whole. Patronage was not lacking, for the number of incoming settlers increased even more rapidly in proportion than the doctors.

Early in 1866 the first medical society organized in Southern Minnesota was established. The physicians of Winona City held a meeting at the office of Dr. Staples and organized themselves into an association called the Medical Society of Winona. Regulations were adopted expressing the objects of the society as follows:

1. Improvement in the science and art of medicine.
2. The promotion of regular and honorable practice in the profession.
3. The maintenance of friendly relations and intercourse among members of the society, and with the regular medical profession at large.
4. The maintenance of suitable and uniform prices for professional services, by adherence to a fee table agreed upon by the society.

The members of the society were Drs. Cole, Hebbard, Staples, and Wedel. Dr. Cole was elected president and Dr. Staples secretary and treasurer for the ensuing year. After organization, the society adopted a set of resolutions and by-laws embodying a fee table, and also agreed to be governed by the code of ethics of the American Medical Association.

Cholera claimed many lives in Minnesota in the year 1866. Fortunately Winona was more scared than hurt. Reports came daily of deaths in New York, Galveston, New Orleans, Saint Louis, and later from just below Saint Paul, but the year ended with no fatalities reported in the town. Early in the year, health officials had made a tour of inspection in the city to find out whether the property holders had complied with the city ordinances in cleaning up their premises, whitewashing cellars, disinfecting drains and so forth. Later, editorial comment demanded further action on the part of the board of health. Special reference was made to a small pond in the neighborhood, and it was argued

that the green scum was very dangerous and "apt to infect the whole community with cholera." A campaign was even effected against rats and the people wholeheartedly rid the city of as much vermin as could be lured into a feed store. Many patent medicines and home remedies were recommended for prevention and cure. Drs. Sheardown and Cole recommended Benson's Rhubarb Cordial to be used in cases of diarrhea or incipient cases of cholera.

A new and more lasting organization of the Winona County Medical Society was effected in April, 1869. Fourteen physicians are listed as charter members: C. S. Sheldon, J. M. Cole, J. B. McGaughey, W. H. H. Richardson, F. Staples, W. J. Youmans, S. B. Sheardown, J. B. Tamblin, H. H. Guthrie, J. Q. A. Vale, A. B. Stuart, Columbus G. Slagel, C. N. Clark, and J. F. Tourtellotte. Of these, the last three were not elected until July. The members of the society were the outstanding physicians of the county. Dr. A. B. Stuart was for many years identified with the history of medicine in Winona. Before coming to this city, he had attended the Lewisburg University and the Berkshire Medical College where he received his M.D. degree. After distinguished service in the Civil War, he graduated from the Bellevue Hospital Medical College and then took up his practice in Winona. While engaged in general practice, he gave especial attention to surgery and had charge of a number of notable cases. He held offices in the Winona County Medical Society, in the State Medical Society, and also in the American Medical Association. In 1872 Dr. Stuart was instrumental in securing the establishment of the Minnesota State Board of Health and became its first president. During the same year, he was elected teacher of surgery in the Winona Preparatory Medical School and soon after held the office of president of that institution. Dr. Stuart practiced until 1877 in Winona and then moved to California in an attempt to improve his health.

Dr. James Brown McGaughey received his early education in private and public schools and in the McDonough Presbyterian College in Illinois. When a youth of nineteen, he enlisted in the army. During his many varied war experiences, he found time to follow his bent for medical studies, and his reading was guided by his brother-in-law, Dr. A. B. Stuart. After the war, he attended Berkshire Medical College at Pittsfield, Massachusetts, and subsequently completed his course at the University of Michigan in 1869. Soon afterward he came to Winona, and entered upon forty-one years of continuous practice of his profession. Dr. McGaughey became a successful physician and surgeon, and was reputed an authoritative diagnostician. His work was characteristically progressive. He made frequent trips to the best hospital clinics and was a tireless reader of professional literature. He was active in state, local and national medical societies and helped to incorporate the Winona Medical School.

Dr. W. J. Youmans, who later edited the *Popular Science Monthly*, practiced in Winona City during the years 1869 and 1870. He had graduated from the medical department of the University of New York, taking special instruction under Professor Draper. Soon afterward he went to England to pursue physiological studies in the laboratory of Prof. Thomas H. Huxley. While there he and Professor Huxley jointly published *The Elements of Physiology and Hygiene*, the treatise on hygiene being Prof. Youmans' work. Returning to America, Dr. Youmans soon came to Winona, where his brothers had a drug business.

(To be continued in May issue.)

President's Letter

THE annual meeting of the Minnesota State Medical Association will be held in Rochester on April 21, 22, and 23. The entire program for the first day will be presented by the Rochester doctors together with a paper on "Arthritis" by Dr. Cecil of New York as their guest. The programs for Tuesday and Wednesday will be by physicians from various parts of the state together with guest speakers of national reputation from other states. These guest speakers will include such men as Fred L. Adair of Chicago on "Obstetrics," John O. Bower of Philadelphia on "Appendicitis," Harry Mock of Chicago on "Head Injuries," A. J. Lanza of New York on "Pneumoconiosis," Norman Jolliffe on "Nutritional Deficiencies," Bernard Nichols of Cleveland on "Radiology," and others; Paul Magnuson of Chicago will bring the fracture symposium to a close with a paper on "Fractures of the Neck of the Femur" (femoral neck).

An outstanding feature and one that is proving very popular in other states is the Round Table discussions; there will be ten of these luncheons each day, those on Monday being conducted by the Rochester group, and on Tuesday and Wednesday by the guest speakers as well as by leaders on various subjects in our own state. At the annual meeting in Michigan and also in Wisconsin last year those who did not register in advance could not get in for lack of space. Each member will be given a card to fill out designating his choice for these Round Table luncheons and it will be wise to register your choice in advance as the accommodations will be arranged according to the applications filed.

The meeting this year will be held in the new Auditorium in Rochester. (Ours will be the first large meeting to use this beautiful new building which was presented to Rochester by the Mayo Brothers.) This building is commodious, well arranged, and but a short walk from the hotels. There will be ample space for the fine scientific exhibits and also for the advertising displays; the cinema films on various scientific subjects will be shown in an adjacent room.

Keep up-to-date by attending our annual meeting. The latest information on a large number of subjects will be given there.

BERTRAM S. ADAMS, President
Minnesota State Medical Association.

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BUSINESS MANAGER
J. R. BRUCE

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ANNUAL STATE MEETING

THE time has come for another annual state medical meeting, the program of which appears in this issue. The three-day meeting takes place Monday, Tuesday and Wednesday, April 22, 23 and 24, 1940, at Rochester, Minnesota.

The Scientific Committee, composed of President Adams, Past President Earl, Executive Secretary Rossell and Dr. W. A. O'Brien, have arranged an attractive program, including a number of out-of-state visitors. Monday will be

devoted to a program of addresses and Round Table discussions by Mayo Clinic dictors with the Mayo Foundation lecture by Dr. Russell L. Cecil of New York in the afternoon.

Entertainment in the form of open house will be provided the visitors at the Mayo Civic Auditorium, Monday evening, by the Mayo Clinic and the Olmsted - Houston - Fillmore - Dodge County Medical Society. This is the first time a medical meeting will have been held in the new auditorium presented to the city of Rochester by the Mayo brothers.

The banquet, Tuesday night, will be held at the Rochester State Hospital, and will be addressed by Governor Stassen and Mr. B. H. Ridder of the *Saint Paul Pioneer Press and Dispatch*.

Enough said—except for the golf tournament to be held Sunday, April 21, at the Rochester Country Club, open to all state association members.

These same dates are also the occasion for the annual meeting of the Women's Auxiliary of the State Medical Association. Mrs. A. C. Baker, of Fergus Falls, president, announces that Mrs. Rollo K. Packard, Chicago, president of the National Auxiliary, will attend the meeting. A full program for visiting auxiliary members has been provided by the local auxiliary group.

A perusal of the program will convince lethargic members that the addresses, scientific cinemas and exhibits, and the opportunity to renew old acquaintances and to make new ones, will be well worth the sacrifice of three days away from the grind.

CHILDREN OF DIABETIC MOTHERS

OBSTETRICS in diabetic mothers has not become an easier problem since the development of insulin because there are more pregnancies in diabetic women who often were sterile in pre-insulin times, or died before they were able to have any children.

Although it has been known for a long time that the children of diabetic mothers are beset by grave dangers—ante partum as well as post

partum—one has the impression that very little thought is given this problem and that no definite plans are made as to the care of these infants during the immediate post partum period.

For years we used to think that a diabetic woman improves greatly during pregnancy, apparently receiving some insulin from the fetus. Although there have been several cases that needed much less insulin during pregnancy than before, it cannot be said that *most* women show such an improvement. It is true that very often there is a very normal pregnancy up to the sixth month, but after that the obstetrician has a right to expect the mother to become a serious problem. Edema, albuminuria, or rise of blood pressure may make their appearance at any time with resulting danger to mother and child.

The child of a diabetic mother may present the following serious problems: high mortality, gigantism, congenital defects, hypoglycemia.

The high mortality is due mainly to stillbirths and asphyxia neonatorum. This has been known for a long time, but the reason for this has not been clear. In a relatively recent article (1939), Priscilla White explains the frequent occurrence of these accidents by extra-diabetic factors—based on her own investigations, as well as those of Murphy (1933) and Smith and Smith (1935, 1936, 1937). More than 30 per cent of diabetic mothers develop pre-eclamptic toxemias, and it has been established that an “excess of serum prolan precedes, predicts and perhaps causes” these toxemias. It seems that the high percentage of stillbirths is not directly related to the diabetes as such, or to diabetic acidosis, but shows definite relationship to the pre-eclamptic toxemias. Patients with normal serum prolan values developed no pre-eclamptic toxemias and there were no miscarriages; those with supernormal values had pre-eclamptic toxemias or miscarried. As proof of this theory she was able to show that patients with supernormal values of prolan responded to replacement estrin and progestin therapy. None of nine patients treated in this manner developed a progressive toxemia, normal prolan values were restored, and none had a miscarriage. All fetal and neonatal deaths in her series of thirty-four cases, except one, occurred in women with abnormally increased prolan values. White concludes that the rise of prolan indicates an abnormal balance, and the

placenta is destroyed as a defensive mechanism. Incidentally, of course, the fetus dies and miscarriage is the result. Although the series of cases is relatively small, the figures seem to be significant: fetal or neonatal mortality in cases with high serum prolan without specific treatment, 50 per cent; in cases with normal prolan, 8 per cent; and in those with high prolan but specific treatment, 11 per cent (1 of 9 cases; this mother received definitely less and apparently insufficient replacement treatment).

Gigantism in children of diabetic mothers has been reported for about half a century, and has usually been attributed to the hyperglycemia of the mother. This theory has been adhered to up to now. White, however, cannot find any correlation between the size of the infant and the control of the mother's diabetes. She suspects that this too may have its cause in the abnormal hormone balance, because she found the larger infants usually in the cases with high serum prolan, who had no specific treatment. Snyder (1934) and Hoopes (1934) were able to produce a similar picture in rats and rabbits by means of prolan injections: miscarriages, stillbirths, oversized fetus, etc. Statistics show that 18 per cent of the children of diabetic mothers weighed at birth over 10 pounds (Skipper, 1933), and that 60 per cent weighed over 8 pounds (White, 1935). All ten cases of hypertrophy and hyperplasia of the pancreas, collected by Rascoff et al. (1938), weighed 9 pounds or more.

The prevalence of congenital defects in infants of diabetic mothers is not readily noticeable because of the relatively small number of diabetic mothers, but when larger series of cases are examined, one is surprised to find that the incidence is about twice that of control cases (Skipper, 1933; Joslin, 1937). As diabetes apparently is genetic in origin, there may be some relation of this factor with the higher incidence of congenital defects (Joslin).

Hypoglycemia in the newborn of a diabetic mother is a grave condition, and may easily lead to death. In fatal cases, hyperplasia and hypertrophy of the Langerhans islets have been demonstrated in a number of cases. The first case to be fully published was that of Dubreul and Anderodias (1920). In 1938 Rascoff, Beilby and Jacobi collected ten cases—their own and those published between 1920 and 1936. The

islet tissue was found greatly increased; it varied from four to six times to twenty to thirty times that of a normal pancreas. Other microscopical changes were peri-insular edema and fibrosis and eosinophilic infiltration of the stroma between islets and acini and sometimes of the stroma within the islets. Of other organs, the adrenals were found affected in two cases (hemorrhage and necrosis), and the liver was enlarged in one case. All mothers suffered from severe, often uncontrolled, diabetes, except one who was found to have a latent diabetes. That there is no definite correlation between the blood sugar level and the insular size was shown very recently by Helvig (1940). It is logical to assume that the etiologic factor for this hypertrophy is the hyperglycemic state of the mother.

The symptomatology is not always very definite. Often the dominant symptoms are twitching and convulsions, but these are not always present. At other times the dominant symptom is cyanosis, as was the case in Randall and Rynearson's group of seven children of diabetic mothers (1936). Among these seven, only one showed twitching and convulsions, and that child had a normal blood sugar. Occasionally there may be no symptoms with a blood sugar as low as 45 mg. (Skipper).

Hypoglycemia may be due to adrenal hemorrhage alone. Of course it is most difficult to differentiate it from the hypoglycemia due to hyperinsulinism, especially if the mother has diabetes. Both may exhibit acute onset with symptoms of shock, followed by collapse and death within twenty-four hours. Usually, however, the symptoms of adrenal hemorrhage do not appear until thirty-six to seventy-two hours post partum, and there is usually high fever and very rapid, shallow respiration. The damage to the adrenal gland in itself seems to make the organism more sensitive to insulin, and the severest picture can be expected when hyperinsulinism and adrenal damage occur in the same infant.

It is also not an easy task to differentiate hypoglycemia from other pathologic conditions of the newborn—asphyxia, cerebral hemorrhage, etc. It seems a good rule to investigate the blood sugar when the child is large and difficult to resuscitate by aspiration and inhalation of carbon dioxide and oxygen. Cerebral conditions

usually respond slowly. There is marked depression of the sensorium and the reflexes, and there may be a characteristic cerebral cry or whine. Hypoglycemia responds more rapidly and the child has a good cry once respiration is established, and there is a good sucking reflex until coma supervenes.

The treatment consists of rapid supply of dextrose by various routes until the blood sugar rises to a fairly normal level, and all dangerous symptoms disappear. Higgons (1935) used 100 c.c. of a 5 per cent glucose solution subcutaneously, and some physicians used blood from the mother because of the high sugar content. Randall and Rynearson (1936) were able to deliver successfully and guide through the newborn period eight successive children born to diabetic mothers. The treatment varied somewhat with every case, and was guided by the symptoms, the blood sugar, and the ability to retain feedings by mouth. First, the infant should receive all the treatment necessary to establish normal respiration—aspiration, oxygen with carbon dioxide, etc. The length of time the child should be kept in an oxygen-carbon dioxide or oxygen atmosphere depends on the child's respiration. Ten per cent dextrose is administered intramuscularly (5 c.c. in each buttock). A blood sugar determination should be carried out as soon as possible, and further intramuscular injections may be given at intervals of one or more hours if indicated.

Feedings in form of 10 to 20 per cent dextrose solution can be started after two to four hours and repeated every one to two hours for the first day, or even longer. The oral treatment with dextrose solution and the time when a formula with a high carbohydrate content should be started depends on whether or not the infant is able to retain feedings.

Closest observation is essential for at least two to three days in cases that show definite symptoms, particularly as we are not able to say how long there is danger from a complicating hypoglycemia. Repeated blood sugar determinations by a micro-method should be done and the treatment continued until all symptoms have disappeared and the blood sugar level is no longer dangerously low.

It is of the greatest importance to make plans for the newborn of any diabetic mother *before the child is born*. The laboratory should be

ready to make a sugar test on the cord blood or the child, and if this is not possible, dextrose should be administered as a precautionary measure.

Of even greater importance is the obstetrical problem during the last few months of pregnancy. The diabetes should be controlled by all means. A slight tendency to show less sugar for a while should not lead to a radical reduction or even cessation of insulin, because of the undue strain upon the fetal pancreas and the possibility of a hypertrophy under such conditions. Hormone treatment to restore hormonal balance probably will be treatment for the prevention of toxemias and consecutive miscarriage or intrauterine death. The same type of treatment may reduce the number of over-sized children. But until such treatment is put on a practical basis, White's contention (1935) that "the premature delivery of the fully developed though chronologically premature infant of the diabetic mother by cesarean section is the obstetrician's successful answer to the challenge" should be kept in mind. Randall and Rynearson, who stress the same idea, recommend the thirty-sixth to thirty-seventh week of pregnancy for this purpose.

ROBERT ROSENTHAL, M.D.

CABOT CRITICIZES AGAIN

THE article entitled "Give the Patient a Break" by Dr. Hugh Cabot, which appeared in the *American Magazine* for April, doubtless caused resentment in the minds of most physicians who happened to read it. It savors too much of washing dirty linen in public, and certainly is an addition to the present-day propaganda to discredit not only the present system of private practice but also the profession in general.

The rank and file of the profession will concur with the author in his attitude toward certain medical practices which he decries. Fee-splitting is one. Exorbitant fees in respect to the patient's ability to pay is another. This is a relative matter, however, for a fee of \$100 may be excessive for one patient and one for \$10,000 may conceivably be too small for valuable service rendered to one who pays a million dollar income tax. An excessive fee, whether it be \$100 or \$10,000, if it is more than the patient should

be charged, is condemned by the majority of doctors. The bad practice of overcharging is not a valid reason for condemning the fee system.

The author thinks the fee system all wrong, and cites his own experience in charging large fees as proof. If in his own early experience he overcharged, his self-condemnation is justified—not the system.

Group practice is the thing, according to the author. But he is not sure whether the general practitioner can be dispensed with. His contention that the specialist is necessary, is admitted by all. Even his contention that a specialist may see only his specialty, is admitted. This depends, however, on his professional attainments, not on his being a specialist. Others believe in the advantages of medical groups in the practice of medicine. Whether such groups actually lower the cost of care to the patient, is open to argument. The independent doctor can still obtain consultation without difficulty. That the general practitioner can and does care for most medical needs is a fact.

The evils associated with self-styled specialism have long been recognized by the profession and much progress has been made in remedying them. Lack of standards for determining qualifications for specialists were lacking in former days, but have been established by the profession itself. There is no present need for a member of the profession shouting from the housetops about a situation which is being remedied and which never was a major evil.

The author's main cause for disgruntlement is what he claims to be the opposition of medical societies to the prepayment plan of providing for medical care. Is this an accurate statement?

The American Medical Association has given much thought to the whole subject of methods of payment for medical service and has been consistent in its attitude.

In 1934 the House of Delegates took the stand that medical service should be paid for by the patient according to his income status and medical service should have no connection with cash benefits.

In 1935 the same body reaffirmed its opposition to compulsory sickness insurance, whether conducted by a governmental unit or an industrial body. It encouraged medical organizations

to establish plans for providing medical care by voluntary budgeting to meet costs of illness. It also stated that there is nothing inherently good or bad from a medical point of view in different methods of collecting medical fees, providing they are kept separate from any control of practice.

The American Medical Association has been wrongly accused at times of opposing hospital group insurance. Only unsound features of certain plans were criticized.

In 1938 the House of Delegates advocated the principle of cash benefits to members of insurance groups for medical or hospital service in order that the relationship of the patient to the physician or hospital be not disturbed.

This record shows that the national organization is not opposed to prepayment plans *per se*, but is strongly opposed to plans that disturb the fundamental requirement of free choice of physician, place the control of medical care in other hands than the medical profession, and, by insufficient financing or otherwise, result in inferior medical care.

The medical profession has been striving for years, and is today more than ever trying to solve financial problems associated with medical practice, just as more thought is being expended today on economic problems in general. It seems at least poor taste for Dr. Cabot to discredit publicly his own profession in what is doubtless an altruistic attempt on his part to point out a way to provide better medical care at more reasonable cost.

AUTOMOBILE ACCIDENTS

LAST year 32,100 human beings were killed and 1,210,200 were injured, many severely, as a result of automobile accidents. The fatalities are about the same as in 1938 but the number of injured has increased by some 64,000.

A parade with 32,100 people in line is a big parade. If this number of people were killed at one time and in the same place, the newspapers and radio would make headline material. If this number were lost in one battle the toll would make a deep impression. Scattered throughout the land and throughout the year, as these accidents are, one is little impressed by the figure unless someone near and dear to him

has been the victim. Even an injury from an automobile accident makes some impression.

What are we going to do about it? Fatalities from other types of accidents have been greatly reduced in recent years, but the toll for automobile accidents remains about the same high figure.

The problem is much the same as in the care of a disease exacting a large death toll. Find the cause and a campaign of education will bring certain results.

Insurance companies have been active in publicizing the subject of automobile accidents. We doubt whether a reduction in such accidents would result in any pecuniary benefit to insurance companies. But we do know that such a reduction in accidents would mean money in the pockets of all who now carry such insurance. The greater the hazard, the more individuals feel compelled to carry insurance, but the insurance companies do not pay for the deaths, injuries and destruction to property. We do. With fewer accidents, fewer policies would be written, even though the rates were lower.

The Travelers Insurance Company of Hartford has just issued a booklet entitled "Smash Hits," which is an analysis of the automobile accidents of 1939. We hasten to do our bit in calling attention to some of the causes of accidents incident to the driving of automobiles. Being both a pedestrian and driver at times, we will not take sides as to who is most to blame. About the same number of both are killed each year.

Haste and carelessness are the causes of most accidents. Lack of good manners is as often as not the cause of accidents.

More than half the fatalities occur after dark when there is only a quarter of the traffic as in daylight. Too, half of the fatalities among pedestrians occur in those over sixty-five years of age. The conclusion is obvious that drivers do not slow down sufficiently after dark. Loss of keenness of the senses and agility in older individuals make this group particularly susceptible to automobile accidents.

Attention should not be centered on haste and carelessness alone in an effort to remedy the present situation. A hundred and one additional steps can be taken to minimize the possibility of accidents. Speed laws, traffic regulations, rules of the road, periodic checking of brakes, severe

punishment for drunken driving—all merit attention. As in many similar problems, education and an aroused public opinion will do much to reduce the high price we pay for a great convenience.

In Memoriam

Louis Guinard

1864-1939

The death of Guinard, September 5, 1939, just when France was being mobilized for the war, brought lasting grief to thousands in spite of their preoccupation with national affairs. Among them were physicians who treated tuberculosis, his friends and pupils, as well as the patients whom he had brought back to health. In the hearts of the French people he had a place similar to that filled by Trudeau in America. His entire life was devoted to one great task, the alleviation of the suffering caused by tuberculosis. The fact that France has produced such men gives us hope for the future of the world at a time when violence is rampant and the world is on fire.

The first sanatorium in France, Mangini at Hauteville, was opened by his friend Dumarest in 1896. Bligny, in the valley of the Chevreuse, admitted its first patients in August, 1903, with Guinard as director. It was for the common people of Paris and had one hundred and twenty beds. He remained there until his death. He had no other ambition than the health of his patients and the success of the institution. Drolet and the writer visited him there one pleasant Sunday in 1917. We were invited to dinner and sat with the patients as he always did. Most of the patients were soldiers. Afterward we saw them reclining in the liegehallen or long porches. We met Mme. Guinard and finally bade the doctor good-bye at the front gate where he had come, not only to see us off but to wish God-speed to the many relatives and friends of patients who were visitors that afternoon.

Dr. Marcle visited Bligny later and became a close friend of the Guinards. To all of us his life has been an inspiration.

A. T. LAIRD.

Leonard J. Nilles

1902-1940

Dr. Leonard John Nilles of Rollingstone, Minnesota, died at the Winona General Hospital on February 2, 1940, of rheumatic heart disease.

Dr. Nilles was born at Rollingstone, Minnesota, on July 24, 1902. He received his grade school education in Holy Trinity Parochial School at Rollingstone, following which he attended Holy Trinity High School, from which he was graduated. His pre-medical training was received at St. Mary's College at Winona, Minnesota. In 1931 he enrolled in the University of

Minnesota School of Medicine, from which he graduated in June, 1935. He spent a year of internship at St. Mary's Hospital in Minneapolis, following which he entered general practice at Rollingstone, Minnesota, where he continued to the time of his death.

On June 18, 1935, he was married to Miss Mary Bochnak of Minneapolis. He is survived by his wife, a brother, Arnold, and two sisters, Hattie and Viola.

Dr. Nilles was a member of the American Medical Association, Minnesota State Medical Association, Winona County Medical Society and the Southern Minnesota Medical Association. He was a member of the Knights of Columbus, Council 639, of Winona, Minnesota, St. Nicholas Society of Rollingstone and the Rollingstone Civic Club, of which he was president. He was known as a sincere, honest and conscientious practitioner and was trusted and regarded highly by the people of his community and his fellow practitioners.

Fred H. Stangl

1893-1940

Dr. Fred H. Stangl died March 19, 1940, following a four weeks' illness of subacute bacterial endocarditis. He died in the St. Cloud Hospital where he was a member of the staff and also pathologist.

Doctor Stangl graduated from the University of Chicago and Rush Medical College in 1918 and served his internship in the Cook County Hospital, following which, he served as pathologist for the Cook County Hospital for three years. In 1922 he came to St. Cloud where he has been in practice since that time.

He was a member of the Nu Sigma Nu Fraternity. During the World War he served as consultant to the Naval Training Station in Chicago.

During his practice he was a member of the Lewis-Stangl Clinic, St. Cloud, where he was associated with Dr. C. B. Lewis, Dr. W. L. Freeman and his brother, Dr. P. E. Stangl.

He was a member of the Stearns-Benton County Medical Society, Minnesota State Medical Association, a Fellow in the American Medical Association and an active member of the American Society of Clinical Pathologists. He made various contributions to literature on influenza during the 1918-1920 epidemic and on the growth of the tetanus bacilli.

Correction.—Attention is called to an error in the section on History of Medicine in Hennepin County, which appeared on page 181 of the March issue. In the list of Commissioners of Health for the City of Minneapolis under the year 1919, statement was made that Dr. H. M. Guilford died. The information in parentheses should have read: (*Dr. H. M. Guilford resigned December 15, 1919. Dr. Elizabeth Woodworth took his place temporarily until his successor, Dr. F. E. Harrington, took office January 1, 1920.*) According to latest reports Dr. Guilford is living in Madison, Wisconsin, where he is associated with the State Board of Health.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

COUNTY OFFICERS MEET

County officers met in discussion groups according to their interests this year instead of according to district groupings.

The result was some lively discussions of current economic and welfare problems of Minnesota, most of which were summarized neatly and provocatively by discussion leaders as follows:

Medical Relief

Dr. W. A. Coventry, Chairman, Committee on Low Income and Indigent Problems: Our relationship with Director Walter Finke of the Division of Social Welfare is good. With the aid of his medical advisory committee, I believe he will eventually straighten out the relief tangle in Minnesota and insist upon sound, uniform policies all over the state.

Tough Committee

In the meantime, you will be interested in the plan worked out in one county as a substitute for a county doctor plan. This plan was just outlined for us by one of the men who has helped to engineer it. In this county, the doctors arrived at an agreement with the county welfare board whereby all the doctors in the county were to take care of welfare patients for a sum that would not exceed the amount paid before to two county doctors and one township doctor, the first year. They established a fee schedule and a tough working committee of doctors to audit medical bills and supervise the service. The doctors got 60 per cent of normal fees for medical work, 40 per cent of normal fees for surgical work. Physicians were required to itemize their bills. If the record was not complete, the bill was cut. Hospital cases were taken care of in their own community as far as possible. A strenuous effort was made to get the disabled back to work. Last year, the cost to the county for caring for seventy-five people locally was \$2,650.00, while the cost of caring for 18 cases at the University hospitals was \$1,662.00.

When a group of doctors can agree on a workable plan and see that it is put into effect as these men have done it is quite a hopeful sign.

There were many hopeful findings in the return on the questionnaire concerning medical relief plans sent out all over the state last month under the auspices of the Committee on Low Income and Indigent Problems.

Drift to Free Choice

For instance, the drift is definitely to free choice of physician in handling of relief work in Minnesota. Only seven contact committee members reported county doctors.

Seventy-five per cent of the counties are using the old SERA fee schedules. Reductions from normal prevailing fees varied on these reports from 10 to 60 per cent. The majority were between 40 and 50 per cent. Need of a universal fee schedule seems obvious from this questionnaire. Fees for some surgical operations vary from \$100.00 to \$200.00. The average for hysterectomy was found to be \$150.00; for gall bladder \$100.00; for tonsillectomy \$15.00; and for hospital obstetrics \$15.00.

Most of those who responded are dissatisfied with the township plan of handling care for the indigent.

In most cases authorizations are secured from the county welfare board. In other cases, authorizations were secured from any official, up to the mayor.

For State-wide Campaign

L. R. Critchfield, Chairman, Committee on Immunization and Vaccination: It is essential that we make a concerted state-wide effort to push vaccination and immunization of children in our state and the first step is undoubtedly a survey of the extent to which these measures are now being pushed by county medical societies. When we have this information, which, we hope, will be available for the State Meeting, then we want to draw up a standard method which will be available to every county in the state for this work. Every possible assistance will be given by the committee to foster this effort.

Overcrowding and Senility Problem

Dr. George Earl, Chairman, University Relations Committee: The current situation in the state institutions is very briefly as follows:

There are 500 beds in the University hospitals and they could use 5,000. Hundreds of hernia cases, tonsillectomies, prostatectomies are on the waiting list, and undoubtedly these cases should be cared for at home.

Tuberculosis sanatoria are not overcrowded; but the tuberculosis problem of the other state institutions, especially the institutions for the insane, is acute. A separate tuberculosis institution is needed for care of these patients. More coöperation between the tuberculosis institutions and private physicians is needed also, in after-care of discharged patients.

The School for the Feeble-Minded at Faribault is overcrowded and many of its cases have been transferred to the Colony for Epileptics at Cambridge with the result of over-crowding at the Cambridge Institution also. Institutions for the insane are being filled up with the senile cases. Beds are two feet apart in some institutions, and in all of them the senile, who are multiplying with the extension of our life span, are crowding out the younger people for whom treatment might be effective. We are going to have to lay out more money for care of the older insane.

The inebriate problem also complicates the condition in our nervous and mental institutions. These cases should be removed from the state hospitals and sanatoria and placed in state workhouses, where they could support themselves.

For Professional Get-togethers

Dr. J. M. Hayes, Minneapolis, Chairman, Committee on Inter-Professional Relationships: The first chairman of the Inter-Professional Committee, Dr. F. J. Savage, put the committee on our map but was unable to get far with the promotion of inter-professional meetings in the individual counties. We know, in Hennepin County, the value of such get-togethers. Our "Economics Club" is now some years old and it has been very effective in handling some of our Hennepin County problems.

This year, we are hoping to see that there are more such meetings throughout the state. We have already sent out letters to the secretaries following a meeting of the state committee last month. We are going to follow up those letters until some action is achieved.

Hospital Building

Dr. L. L. Sogge, Chairman, Committee on Public Policy: There are two bills for hospital building in Congress now: one, introduced by Senator Wagner of New York, for emergency building of hospitals in communities which can operate but cannot construct such institutions; the other introduced by Senator Mead of New York for a larger appropriation to be made available as needed for construction of hospitals and other sanitary projects and facilities and also to provide funds for operations if they are needed for a period up to four years.

"We Feel More Kindly"

We feel more kindly toward Senator Wagner as a result of his new bill than we did before. His program is fine in theory, but I, myself, cannot see how any community, which is so poor it cannot build a hospital, will be able to keep a hospital going. The proposal brings up many questions. Will there be physicians to staff the hospital in these communities or will it be necessary to import them? If a hospital is built as suggested and the community fails to live up to standards or fails to support the hospital, will it then revert to the government and be run by the government as a federal medical institution for civilians?

I do not know of any community in Minnesota that could make application for a hospital of this kind. It seems to me far better to arrange for assistance to already existing hospitals so as to provide for occupancy of already existing beds.

Objectives Should Be Supported

Dr. R. G. Leland, Chicago, Director, Bureau of Medical Economics, American Medical Association: The profession of medicine should view the entire situation which has led to current legislative proposals with understanding and sympathy. Objectives should be supported but the means to achieve the objectives should be carefully considered. I doubt if any of us can speak with certainty about the new federal hospital building proposal until we know just what the relationship is to be between the federal government and local control. If the hospital is not operated to conform with standards of the federal government it might, indeed, revert to federal control.

I believe we should explore every other possibility for building of any urgently needed hospital without the investment of federal funds. We should thus avoid any possibility of competition with church and voluntary hospitals. Certainly, we must proceed cautiously and study carefully anything, however attractive it may be, which might eventually carry with it federal control for care of the sick.

Fracture Program

Dr. R. G. Webb, Chairman, Committee on Fractures: By means of active fracture committees, whose chairmen are members of a state-wide fracture committee, we are hoping to establish a state-wide program for better first-aid in fracture cases in Minnesota. We need better transportation for fracture cases; also, better hospital equipment for care of these cases, better x-rays and, finally, better post-graduate education in the handling of these cases.

A part of the program must be carried on with public groups of all kinds. Lay training in first-aid is essential. It is equally essential that all ambulances be required by ordinance to carry proper equipment. Good emergency fracture equipment can be constructed for \$1.10 (10 cents for iron and \$1.00 for labor). But our educational program must not stop there. Technicians need instruction in taking of radiographs and we, ourselves, need to discuss our cases freely in hospital staff meetings, eliminating all personal feeling so that we may learn from each others' experiences.

Fractures present one of our most serious problems. The problem cannot be met without an active state-wide program and uniform methods.

"We Seek from You"

Mr. Walter Finke, Director, Division of Social Welfare: We offer you our whole-hearted coöperation in the solution of the medical problems of relief and social welfare. We seek from you every help you can give us.

Our medical problems are among the most important that we have before us for solution. We believe

that, for the best result, government agencies and doctors must get together.

Since the re-organization went into effect last July, we have been studying all our expenditures. For instance, we have been able to cut our staff from 560 to 285. We are trying now to find out if five per cent, for example, is the right percentage to pay out of relief funds for medical care. We are also studying every phase of our medical program with the Medical Advisory Committee of doctors selected from among a list submitted by your association. Our object is to aid and educate the County Welfare Boards upon whom the final responsibility rests. In dealing with the county welfare boards, we must depend, as you know, upon coöperation and education rather than any mandatory right.

New Methods Developed

The principle of decentralization which applies here is sound, I am sure, and good progress can be made within our present set-up. We have developed new methods of procedure for the medical care of several groups which come within the province of the Division of Social Welfare in coöperation with the Medical Advisory Committee. We are now starting on procedures for recipients of Aid to Dependent Children. What we do on this matter as on all other procedures involving medical care will be done only with and through the Medical Advisory Committee.

Learn by Reading

Dr. William A. O'Brien, Director, Post-Graduate Medical Education, University of Minnesota:

We hear a great deal about the educational value of the radio; but the amount of learning actually absorbed by ear is small unless it is supplemented by reading and fosters reading.

The principal means of post-graduate education for doctors are post-graduate courses, private reading, and consultation.

In the future there will be two types of people—those who do and those who do not continue their formal education after their under-graduate training is completed.

Realization of this fact is indicated in the large number of bids for continued education which come to us nowadays from older age groups.

We need to continue our studies because of the influx of new knowledge which began about twenty years ago and continues without a pause.

Gaps Must Be Filled

There were gaps in the undergraduate education of all of us which must be filled in addition to keeping all of our information up to date. In so doing we are obliged to combat tendencies to indifference and ignorance and a feeling that "the old stuff was good enough." It is the essence of medicine in a democracy that every man should have the opportunity to be aware of every new thing.

It is encouraging to know that we can go on learning into our seventy's. As we grow older, we

tend to lose, not the ability, but the desire to learn.

The commonest excuses heard among doctors for not taking this or that course are: "too busy," "can't get away," or "patients need them." To those who give the last named excuse we sometimes say: "Think how many might live because you went away."

Remarkable Growth

So far, 2,120 have registered for medical and hospital courses of three days to a week at the Center for Continuation Study. Growth of interest among hospital personnel in these courses has been remarkable. The Center has proved its worth as a new method of providing intensive post-graduate education in the guise of a professional vacation. As such, it is unique in the United States, but there are other methods of post-graduate education which should not be neglected. Reading is better than listening and writing is better than reading. We should keep up on the medical journals and the new monographs. Incidentally, packets offered in connection with the State Medical Association's subject-of-the-month programs offer a valuable aid to professional education as well as to public health education and everybody should send for them.

In the midst of a busy life, the late W. J. Mayo found time for an hour's reading of the medical journals every day. Obviously, a regular program of reading pays.

There are two ways to improve our public health; of course, one is by police power, the other is by constant voluntary individual improvement in the practice of medicine.

THE COUNCIL MEETS

The Minnesota State Medical Association will have a representative at the United States Pharmacopœial convention for the first time this year.

Decision to send Dr. Raymond N. Bieter, University of Minnesota, official delegate from the association, was made by the Council at its February 23rd meeting with a view to securing an adequate representation of medical men at this important convention.

Doctors in Minority

The United States Pharmacopœial convention meets once every ten years for the purpose of setting standards for old accepted drugs and for new drugs that are to be introduced into medical practice. Pharmacists and pharmaceutical manufacturers are well represented at these conventions but physicians and medical schools, both of whom are equally interested in the deliberations, are sometimes in the minority. Dr. Bieter will confer with Dr. A. E. Osterberg of Rochester, and Dr. E. J. Fogelberg of St. Paul, the

other official Minnesota delegates, and with Alternates J. L. Bollman of Rochester and F. G. Benn of Minneapolis as to policies and procedures of the convention.

Insurance Policies Studied

Several questions were submitted concerning provisions of policies written by the large companies for malpractice insurance in Minnesota. The Council reemphasized a fact which seems to be the source of some misunderstanding among members, that the Minnesota State Medical Association has never officially endorsed any policy for malpractice insurance.

Several reputable insurance companies write malpractice insurance in Minnesota. The policies of all these companies will be studied and a report made to the House of Delegates.

May Advertise

County medical societies may sponsor local advertising campaigns on modern medical service and the function of the family doctor, if the members vote their approval. A series of advertisements prepared by a Minnesota newspaper man was submitted to the Council for its information and the Council voted again to leave it to the county medical society to determine local policies on such matters. Only one stipulation was made—that the copy be carefully read and approved by the doctors.

* * *

Special publicity campaigns launched in connection with the opening of hospitals or other community projects involving the doctors were also judged to be a matter for local determination and supervision.

Epilepsy Organization Incorporates

Articles of incorporation for a new voluntary health education agency were presented by Dr. D. E. McBroom of Cambridge for the information of the Council. The new organization will foster research in epilepsy and at the same time try to extend public understanding of the disease. Many physicians are interested in the new organization, Dr. McBroom said, and every effort is being made to see that activities of the new society are kept under proper supervision and control.

WOMEN SHOULD KNOW

The active interest of large women's organizations in the Wagner Health bill has persisted in spite of the fact that the bill has never been reported out of committee and a new hospital bill has ostensibly taken its place in the affections of its promoter.

It is clear that a concerted drive to press the women's organizations for definite action on this bill, or at least on the general provisions of the National Health program, is in progress.

It is, of course, entirely proper that American women should inform themselves on important national issues such as this one. If the American people are in grave need of sweeping reforms in the care of the sick and of tremendous new appropriations for the public health, the women should know about the need and work for them.

On the other hand, if the proposed legislation endangers something very precious to Americans and if the vast appropriations will achieve, principally, the establishment of new government bureaus, at a heavy cost to future generations, with no assurance of practical aid where aid is needed, then American women should know about that, too.

Outlines Distributed

Mimeographed outlines of the report of the President's Inter-Departmental Committee, including the report of findings of the WPA Health Survey and of the Wagner bill which aims to correct the situation, have been prepared and are already being distributed among club-women in Minnesota.

No official action has ever been taken by the largest of the women's organizations, the Minnesota State Federation of Women's Clubs, on the subject. Officers of the organization have conferred with representatives of the Minnesota State Medical Association on the matter and are well informed on the policies for Minnesota of the doctors and the public health officials of the state. They have asked for a companion piece expressing this policy and indicating actual needs and how they can be met in Minnesota for distribution to their members. This material is now being prepared and will be available upon request.

Easy Appeal

It is easy enough to make an appeal to a group whose professed interest is public welfare and particularly the welfare of the women and children, on the basis of an alleged need for medical care.

Backers of the National Health Program in toto are quick to seize upon the genuine idealism of such groups as a means of persuasion.

Physicians who explain the attitude of medicine toward the whole problem must speak in terms of idealism, also—but of a sounder idealism which cherishes the fine things already accomplished, which preserves human dignity, safeguards orderly progress and protects it from the heavy hand of politics.

Women should know that you cannot bring about a millennium by passing a bill and making an appropriation especially in the field of health. Improvement in our national health depends upon many factors, and ample facilities for medical and hospital care constitute but one of them. A clear understanding on the part of everybody about what makes a healthy people and how progress in medical science and the control of disease are achieved should be the objective.

DOCTORS CAREY AND SHIPSTEAD SPEAKING

Minnesota dentists, last month, brought to the Twin Cities one of the most vigorous and picturesque of all medical orators, Dr. Eben J. Carey, Dean of Medicine at Marquette University.

During his stay in Saint Paul, Dr. Carey talked to the dentists at their annual meeting on government medicine; he spoke on the radio and he addressed the regular Open Forum of the Chamber of Commerce. Reverberations are still heard in widening circles from his pungent and vigorous remarks.

Senator Henrik Shipstead, guest of honor, also chose to express himself in unmistakable opposition to government operation of medical and dental services at the dentists' meeting. A unique occasion—take it all in all—and one which showed how indissolubly linked are the future of medicine and dentistry and how closely their thinking and their policy parallel the policy of organized medicine.

Befuddled Legislation

Some characteristic excerpts of the remarks of both Dr. Carey and Senator Shipstead are given below:

DR. CAREY: A lot of befuddled legislation is being presented for passage in Congress these days and in our state legislatures. All of it is based on the premises that the cost of medical care is too high in America and that medical care is inadequate.

I challenge both premises.

Americans are the healthiest people ever seen any time, anywhere. Their health depends upon healthy minds and souls as much as upon healthy bodies.

"You Cannot Buy Health"

You cannot go out and buy five dollars' worth of health. And by the same token, you cannot purchase health by immense appropriations of money if, at the same time, you take away the dignity and rights of the human being.

A series of bills was introduced in the Wisconsin legislature a few years ago which would have fastened compulsory sickness insurance, worse than anything in Europe, on the state of Wisconsin. They said there was an acute need for such legislation; but apparently the acute need was really for the doctors and the dentists to put a little emotionalism into the presentation of their own objectives—because we stopped the Beimiller bills by only six votes!

Milwaukee is Healthier

As a result of that vote, however, we made an extensive study of medical care in Wisconsin and we sent Mr. Crownhart to Europe to investigate the European systems after which Beimiller had patterned his legislation. We found that the Irish and the Germans in Milwaukee are far healthier than the Irish in Ireland or the Germans in Germany.

Nothing in Europe could compare with our system of medical care in Milwaukee, Wisconsin, or in any other center of the United States.

Since 1929, we have had bankruptcy in government in the United States and yet there are people who would crowd our bankrupt government into the administration of medical care to the sick.

Bait for Politicians

In America we have a constitution and a Bill of Rights. We determine our course by mutual cooperation, not by paranoid dictatorships. We should understand what a sickness tax will and will not mean. In the first place, it will mean graft because a sickness tax is too big a bait for any politician. In the second place, it will not mean better health. If it did mean that, there would be better health in Europe than there is today.

In any case, health is not an end in itself; it is a means to an end. The purpose of medicine is not to generate healthy brutes but to aid in the generation of healthy, well-balanced human beings, and the souls of

human beings are more important than their bodies! Never should we forget that many magnificently healthy people have crippled bodies. Many who have contributed most to our welfare have suffered from incurable ailments.

To make people believe that you can buy health over the counter—so much health for so much money—is to put false ideas into their heads.

Only True Advance

The only true advance in health as in any other department of life comes by education and coöperation. It is true that in America we sometimes confuse freedom with license. Sometimes we forget that our freedom carries with it responsibilities. Dentists and medical men have accepted those responsibilities in the past. They will continue to accept them in the future if government does not step in to take away that freedom.

"We Are All Human"

SENATOR SHIPSTEAD: All of us are agreed, I believe, that good care must be made available to all who need it. Some think that government should control and finance such care. Others are equally positive that while the government must aid in financing the care of the indigent, if the government attempts to control and regulate all care for the sick, both medicine and dentistry will deteriorate.

For my part, I incline to agree with these others. I have seen people who are assured of a salary no matter what they do to take care of a sick patient. I know what happens when the incentive to excellence is removed. We are all human and won't be anything else, God help us, until further notice. . . .

Unemployment Must Be Removed

On the other hand, I do not believe that our present condition can be permanent. Unemployment is like an economic cancer which must be removed or our economy will collapse. But, I believe that we can and will remove it, that ultimately we shall find work for all so that they can take care of themselves.

We must face facts as they are, however, and not as we wish them to be. We do not stand still; we move on, one way or the other.

Over the Line

It is that tendency which we must take into account in the field of public health and medicine. Heretofore, government has occupied itself chiefly in setting standards. Shall it now make the important step over the line into actual operation of the care of the sick?

I believe it must not. I believe that government must levy taxes to pay for care of the poor and I believe that government must continue to fix standards; but I also believe that actual operation of medical care must be left to the men who are trained in the basic

sciences. I do not believe that government bureaus can care for the sick.

Senator Shipstead is the only representative of the healing profession in the Senate. As such and as senior senator from Minnesota, he was presented with a memorial from the Minnesota State Dental Association at this meeting.

"A LEOPARD'S SPOTS"

(Monthly Editorial Prepared by the Medical Advisory Committee)

Since the time when man first began to think and evaluate things, the question of heredity or environment as an answer to the difference in the nature and actions of people has been a moot question.

Why is it that starting with a given personality and heredity tendencies and adding to these a professional education—medicine, law or any other—one man will search for the better things in life while another will find his level in the lower strata of both thought and society? Having once found the level of his environment the chances are overwhelming that he will continue at that level. Criminal tendencies which grasp men who have found the lower levels make it impossible for them to rise out of them. Educational advantages many times seem further to militate against such a change.

Are we, as members of our Association and supposedly in the upper level of society, lowering ourselves in the estimation of our clientele when they find us not only associating with but condoning the criminal acts of certain of our profession by urging their retention in medical circles?

If the writing of an unnecessary number of narcotic and liquor prescriptions is cause for censure, if the performing of criminal abortions is punishable at law, then your Medical Advisory Committee believes that when men convicted of these crimes testify in Court, especially in malpractice cases, their testimony should be considered of the same level of veracity as the standard of their practice and that men in our Association should think twice before urging their retention in our noble and honorable profession. That you cannot change a leopard's spots no matter what the nature of his environment, goes without saying.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Court Declares Mistrial in Case of Chiropractor

Re State of Minnesota v. Arthur J. Kolling.
On March 21, 1940, after three days of trial, Judge W. W. Bardwell declared a mistrial in the prosecution of Arthur J. Kolling, chiropractor, 805 LaSalle Avenue, Minneapolis. The defendant's lawyer stated that the defendant was seriously ill with ptomaine poisoning and under the care of Dr. W. A. Bessesen, physician and surgeon. A statement from Dr. Bessesen was presented to the Court. Judge Bardwell promptly declared a mistrial and discharged the jury.

The defendant, who is not licensed to practice medicine in the State of Minnesota, but who holds only a chiropractic license, owns and operates the Hennepin Clinic at 805 LaSalle Avenue, Minneapolis. He was indicted by the grand jury of Hennepin County on May 16, 1939, on a charge of practicing medicine without a license. The indictment grew out of testimony that the defendant sutured a wound of a ten-year-old boy who had been injured by an automobile at 8th and LaSalle Avenue, Minneapolis, and was taken to the office of the defendant prior to the arrival of the police ambulance. The accident occurred on April 14, 1939, and on April 28, 1939, the defendant sent the family a bill of \$25 for "services rendered."

Kolling was first placed on trial on this indictment in June, 1939. The jury deliberated more than twenty-six hours and stated to the Court that it was unable to agree. It was reported to be deadlocked 6 to 6. The present trial was a re-trial of the same indictment.

Kolling pleaded guilty in the District Court of Hennepin County in 1928, to a charge of practicing medicine without a license and was fined \$150. In 1938, he pleaded guilty in the United States District Court at Minneapolis to an indictment charging him with a conspiracy of violating the Internal Revenue laws of the United States. He was fined \$2,000 on this charge and upon the payment of this fine, a two-year prison sentence was suspended for a period of three years.

Physicians Licensed February 9, 1940

January Examination

Anderson, Bruce Murat—Stanford U., M.D. 1938, Rochester.

Arack, George—U. of Minn., M.B. 1939, Saint Paul.

Ashburn, Frank Strother—U. of Texas, M.D., 1938, Minneapolis.

Barker, John Dennis—U. of Minn., M.D. 1939, Duluth.

Beer, John Joseph—U. of Minn., M.B., 1939, Saint Paul.

Bergh, Solveig Margaret—U. of Minn., M.B. 1938, M.D. 1939, Minneapolis.

Brown, Robert Clifford—U. of Mich., M.D. 1933, Saint Paul.

Campbell, Joseph Robert—U. of Manitoba, M.D., 1937, Rochester.

Cariker, Mildred—U. of Texas, M.D. 1936, Rochester.

Dysterheft, Arnold H.—U. of Minn., M.B., 1937, M.D. 1938, Glencoe.

Eaves, George Bennet—U. of Minn., M.D., 1938, M.D. 1939, Minneapolis.

Evans, Gerald Taylor—McGill U., M.D. 1932, Minneapolis.

Ferguson, Franklin Faulkner—Yale U., M.D. 1936, Rochester.

Foss, Edward L., U. of Wis., M.D. 1934, Rochester.

Foster, Mark Anthony—Harvard U., M.D. 1937, Rochester.

Gjerde, William Peder—U. of Minn., M.B. 1939, Saint Paul.

Grahek, Jack Philip—Marquette, M.D., 1939, Ely.

Ivie, Joseph McKinney—Duke U., M.D., 1938, Rochester.

Jones, Richard Herbert—U. of Minn., M.B., 1939, Saint Paul.

Kelsey, Mavis Parrott—U. of Texas, M.D. 1936, Rochester.

Kent, Richard Nelson—Northwestern, M.B. 1936, M.D. 1937, Rochester.

Kimball, Charles Dunlap—U. of Buffalo, M.D. 1931, Rochester.

Knutson, Gerhard Elmer—U. of Minn., M.B. 1939, Saint Paul.

La Due, John Samuel—Harvard U., M.D., 1936, Minneapolis.

Lehnhoff, Henry John, Jr.—Northwestern, M.B., 1937, M.B. 1938, Rochester.

Leverenz, Carleton Walter—U. of Ill., M.D. 1939, Saint Paul.

Lorber, Victor—U. of Ill., M.D. 1938, Minneapolis.

Lott, Frederick Hartmann—U. of Minn., M.B. 1939, Saint Paul.

Love, William Robert—Kansas U., M.D., 1936, Rochester.

Lynch, Robert Clyde, II—Tulane U., M.D. 1938, Rochester.

MacCarty, Wm. Carpenter, Jr.—Johns Hopkins, M.D. 1937, Rochester.

MacKay, Hunter John—Western Reserve, M.D., 1937, Rochester.

Manson, Arnold Irvin—U. of Minn., M.B. 1938, Minneapolis.

Megibow, Samuel J.—U. of Minn., M.B., 1939, Saint Paul.

Miller, James Rex, Jr.—Northwestern, M.B., 1936, M.D. 1937, Rochester.

Mitchell, Berton David—U. of Minn., M.B. 1939, Saint Paul.

Moen, Dale Veo—U. of Chicago, M.D. 1939, Saint Paul.

Muller, Albrecht Eugene—U. of Minn., M.B. 1939, Saint Paul.

Neale, Roderick Malcolm—Stanford U., M.D. 1936, Rochester.

Otten, Donald Earnest—Northwestern, M.B. 1938, M.D. 1939, Minneapolis.

Palen, Benjamin Joseph—U. of Minn., M.B. 1939, Minneapolis.

Peters, Gustavus Alfred—Indiana U., M.D. 1938, Rochester.

Proffit, William Emory—U. of Minn., M.B. 1939, Minneapolis.

Reiley, Richard Edwin—U. of Iowa, M.D. 1938, Minneapolis.

Sayre, George Pomeroy—McGill U., M.D. 1938, Rochester.

Scott, Frank Matthew—Indiana U., M.D. 1937, Rochester.

Shick, Richard Montgomery—U. of Mich., M.D. 1935, Rochester.

Strom, Gordon Wilnard—U. of Minn., M.B. 1937, M.D. 1938, Rochester.

Teisberg, John Edwin—U. of Minn., M.B. 1939, Saint Paul.

Thompson, John Vernon—U. of Ill., M.D. 1939, Oak Terrace.

Throckmorton, Tom Dercum—Northwestern, M.B. 1937, M.D. 1938, Rochester.

Van Demark, Robert Eugene—Northwestern, M.B. 1938, M.D. 1939, Rochester.

Weisel, Wilson—Harvard U., M.D. 1938, Rochester.

Wilder, Russel Morse—Harvard U., M.D., 1938, Rochester.

Wolf, William Walter, Jr.—Hahnemann, Phila., M.D., 1939, Minneapolis.

National Board Credentials

Johnson, John Woodrow—U. of Minn., M.B. 1938, M.D. 1939, Kerkoven.

OF GENERAL INTEREST

The Minnesota State Medical Association study subject for April is "Cancer of the Digestive Tract."

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Dr. M. H. Larson of Nicollet has opened an office at Waconia for the practice of general medicine and surgery.

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A new directory of graduates of the medical school of the University of Minnesota has been compiled by the *Minnesota Alumni Weekly* office. It replaces a directory issued in 1936.

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Dr. John A. Knights of Bemidji has been appointed Assistant Division Surgeon of the Great Northern Railroad, the division taking in the territory from Duluth to a point west of Bemidji. Dr. Knights is associated in practice with Drs. McCann and Johnson.

* * *

Dr. Albert Balmer, who has been associated with Dr. E. F. McElmeel at Pipestone since June, 1939, opened an office of his own on March 1. He is now located in the offices formerly occupied by the late Dr. Thomas Lowe.

* * *

Rochester was host to approximately twenty-five surgeons from several southern states at a meeting of the Southern Society of Clinical Surgeons, March 27-29. Dr. Charles W. Mayo and Dr. John M. Waugh of the Mayo Clinic arranged the three-day program.

* * *

Dr. Joseph G. Pollard of Hanover, New Hampshire, is spending his sabbatical leave at the University of Minnesota studying methods of teaching personal and public health in the Arts college and also studying the university athletic injury program.

* * *

Dr. Jerome Hilger and Helen Backer, both of Saint Paul, were married January 20, 1940. They have recently returned from their wedding trip in the east and are at home at 37 Inner Drive, Highland Village, Saint Paul.

* * *

Dr. M. E. Maun, pathologist at Saint Joseph's Hospital, Saint Paul, since 1938, has been appointed Assistant Professor of Pathology at the Wayne University Medical School, Detroit, Michigan. Dr. Maun received his medical degree from Northwestern in 1936.

* * *

Dr. Reed M. Nesbit, Head of the Division of Urology at the University of Michigan, will inaugurate the Franklyn R. Wright Lectureship in behalf of the Twin City Urological Society with a lecture on "Hypertension in Unilateral Renal Disease." The lecture will be given at the University of Minnesota. Details will be furnished later.

* * *

Dr. Albert V. Stoesser, associate professor in the pediatrics department at the University of Minnesota,

has been awarded a \$1,000 grant by the Markle Foundation of New York for the support of study of the relation of sodium and potassium balance to asthma.

* * *

The Annual George Chase Christian Lecture presented by the Cancer Institute of the University of Minnesota will be given on Tuesday evening, April 30, by Dr. John J. Bittner, National Cancer Institute Fellow, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. Dr. Bittner will speak on "Breast Cancer as Influenced by Nursing." Medical Sciences Amphitheatre, 8:15 p. m.

* * *

Minnesota Medical Alumni and their wives are urged to obtain tickets on registration at the State Medical Meeting for the annual banquet of the Alumni Association. The banquet will be addressed by Dr. Karl Buehler, Professor of Psychology at St. Thomas College and former head of a psychologic institute in Vienna, on the subject of "Hitler and Austria."

* * *

Dr. E. Sidney Boleyn, 76-year-old Stillwater resident and a relative of the famed Anne, told the County Officers' Medical Conference held in Saint Paul in February, that his mother is 104 years old and his father, about ten years older. Both are still living in India, where they are retired civil service employees of the British government. Greatest record for longevity in the family is an aunt who died at 124 years of age and an uncle at 127.

* * *

Dr. Raymond B. Allen of Detroit, a graduate of the University of Minnesota medical school, Class of 1928, has been appointed executive dean of the Colleges of Medicine, Dentistry and Pharmacy of the University of Illinois in Chicago. Dr. Allen, after completing a fellowship in urology at the Mayo Foundation, served as assistant dean of Columbia University medical school and then went to Wayne University medical school in Detroit as dean.

* * *

Dr. Walter C. Alvarez of Rochester is to be the banquet speaker at the annual meeting of the Northern Tri-State Medical Association in Battle Creek, Michigan, April 9. His topic will be "The Patient Who is Always Ailing in Spite of Many Treatments."

In March, Dr. Alvarez addressed the Douglas County Medical Society meeting in Omaha, Neb., and conducted a clinic in the St. Joseph hospital. He also addressed students of Creighton University school of medicine.

* * *

Dr. Adelbert Louis Dippel became associated with the University of Minnesota as associate professor of obstetrics and gynecology, March 1, to fill the position made vacant by the death of Dr. John A. Urner. Born in LeGrange, Texas, Dr. Dippel attended the University of Texas from 1920-28, receiving his B.A.,

M.A. and M.D. degrees. He did graduate work at Johns Hopkins University School of Medicine, where he has been an instructor and associate in obstetrics.

* * *

The Lotus D. Coffman Memorial Silver Service given by physicians who have attended courses at the Center for Continuation Study was formally accepted February 19, when the service was used for the first time.

The ophthalmologists and otolaryngologists two years ago started the fund for the service, which consists of six pieces—a modern tray, a coffee urn of the Georgian period, and four pieces of 1803 Early American solid silver—teapot, creamer, sugar and waste bowl.

* * *

The spring program at the Center for Continuation Study on the University of Minnesota campus, as announced by Dr. William A. O'Brien, follows:

April 1-6—Venereal Disease
 April 29-May 1—Obstetrics
 May 2-4—Health Problems of College Students
 May 6-11—Electrocardiography
 May 20-25—Pediatrics
 May 23-25—Hospital, Medical and Institutional Library Service
 June 6-8—Gynecologic Tumors

* * *

Two members of the University of Minnesota physiology department have been honored with fellowship awards.

Dr. Earl H. Wood, instructor, has been awarded a National Research Council fellowship in the medical sciences to work with Prof. A. N. Richards of the University of Pennsylvania.

Dr. Gordon K. Moe, also an instructor, has been awarded the Porter fellowship of the American Physiological Society to work with Prof. C. J. Wiggers of the Western Reserve University in Cleveland.

* * *

A new hip pocket oxygen flask and a new face mask, developed by Dr. Walter M. Boothby of the Mayo Clinic, Rochester, in cooperation with Captain Harry Armstrong of the army air corps' materiel division at Wright field, were exhibited at the meeting of the Federated Societies for Experimental Biology and Medicine in New Orleans, March 12-18.

The new mask was designed to prevent a pilot from inadvertently committing suicide, if he accidentally opens his mouth at high altitudes; the oxygen flask, to insure pilots of the necessary supply of gas if they are forced to bail out from high altitudes.

* * *

Physicians under thirty-five years of age, desirous of obtaining active duty with the United States Army, are being offered appointments in the Medical Corps Reserve in the rank of First Lieutenant. Wages of a First Lieutenant are \$225.00 a month (\$263.00, if married); that of a Captain \$278.00 a month (\$316.00, if married). In assignments where government quarters are available these amounts are \$40.00 and \$60.00, \$60.00 and \$80.00 per month less, respectively. Many of those under the age of thirty-two who received such appoint-

ments last year took entrance examinations for commissions in the Regular Army. Those in Minnesota interested should apply to the Commanding General of the Seventh Corps Area, New Federal Building, Omaha, Nebraska.

* * *

Physicians for the Panama Canal zone are wanted, there being a need for additional medical service in connection with the construction of new locks, which is expected to take at least four years.

Duties will be to care for health of employees and to give aid in case of accident. There are several well-equipped staff hospitals in the zone. Several Minnesota graduates are in the service.

Candidates must pass civil service examinations. Initial pay is \$4,000 a year; maintenance may be secured in government houses for \$15 to \$30 a month; a trip to New York on an official boat costs but \$30. The average temperature is 85 degrees.

Further information may be had by writing to Chief Health Officer, Balboa Heights, Canal Zone. Gilbert M. Stevenson, Minnesota '28, Dispensary, Gamboa Canal Zone district, Panama Canal, supplied the above information.

* * *

Several members of the University of Minnesota staff presented papers at the meeting of the Federation of American Societies for Experimental Biology in New Orleans, March 12-18.

Dr. Maurice B. Visscher, head of the department of physiology, presented a paper on "Super High Speed Cinematography of the Isolated Heart-Lung," prepared in cooperation with Dr. G. K. Moe, also of the University of Minnesota staff, and Dr. C. Landis of Columbia and Dr. W. A. Hunt of Wheaton college.

Dr. Charles F. Code, assistant professor of physiology, presented a paper on "A Comparison of the Histamine Content of Blood and Bone Marrow." Dr. Code was awarded the Theobald Smith prize for his work on histamine a year ago by the American Association for the Advancement of Science.

Dr. George O. Burr, professor of physiological chemistry, had for the title of his paper, "Limiting Factors in the Biological Synthesis and Chemical Analysis of Fatty Acids."

Two papers were presented by Dr. G. K. Moe and Dr. E. H. Wood. Titles are "Cardiac and Pulmonary Edema in Isolated Perfused Preparations," and "Correlation between Serum Potassium Changes in the Heart-Lung Preparation and the Therapeutic and Toxic Effects of Digitalis Glucosides."

"The Effect of Adrenalectomy on the Deposition in the Liver of Spectroscopically Active Fatty Acids," was the subject of a paper presented by Drs. Richard H. Barnes, Elmer S. Miller and G. O. Burr.

Dr. Ancel Keys, professor of physiology, presented a paper on "The Valvular Efficiency in Mitral and Aortic Insufficiency," which constituted a study of cardiac output by the x-ray kymograph and the acetylene methods, by which means the proportion of blood which leaks back through an insufficient valve can be determined.

MINNESOTA STATE MEDICAL ASSOCIATION

87th Annual Session

April 22, 23, and 24, 1940

Rochester, Minnesota

ANNOUNCEMENTS

Presiding officers at each session have been instructed by the Committee on Scientific Assembly to show a blue light on the speakers' rostrum two minutes before the end of each speakers' program time. A red light will show when his time is up. All meetings are in charge of committee members.

Register and Secure Your Badge at the Registration desk at the Mayo Civic Auditorium at 8 a. m. Registration on Sunday, April 21, will be in the lobby of the Kahler Hotel.

Telephone Service: Special incoming lines have been installed at the Registration desk. All local and long distance calls will be handled promptly.

Bring Your Membership Card: There will be no registration fee for those who present a membership card or receipt or other evidence from their county society or the state association or the American Medical Association nor for interns or members of associated professions including dentists, pharmacists, nurses, hospital personnel or social welfare workers who present invitations or other identification.

Badges: You are requested to wear your badge while you are on the convention floor. This is important and will greatly assist us to eliminate undesirable persons such as cranks and pickpockets who so frequently try to take advantage of meetings of this character.

Women's Auxiliary: Wives of physicians attending the meeting may secure programs of the business and social sessions of the Women's Auxiliary at the Women's Registration Desk in the lobby of the Kahler Hotel. All visiting women are cordially invited to attend special events arranged by hostesses of the Olmsted-Houston-Fillmore-Dodge County Medical Auxiliary. Among these is a tea at Mayo-wood, Monday, April 22. Every Auxiliary member is invited to attend the Annual Meeting and luncheon Tuesday, April 23, at the Rochester Country Club.

Automobile: Good parking space is available without charge east of the Auditorium.

Luncheons: Thirty-two Round Table Luncheons have been arranged for this meeting at Rochester hotels and restaurants, 11 on Monday, 11 on Tuesday, and 10 on Wednesday. Tickets must be purchased in advance for these luncheons. Lists of subjects and leaders are printed in this program. Attendance at each luncheon is limited, and late comers will be accommodated according to their choice if limits have not already been reached. Price of luncheon ticket is 75 cents.

Annual Banquet: The annual dinner for members, guests and their wives will be held at the Rochester State Hospital, Tuesday evening, 6:30 p. m., April 23. Governor Harold E. Stassen and Mr. Bernard H. Ridder of St. Paul, publisher of the *St. Paul Pioneer Press and Dispatch*, will be the banquet speakers. Tickets \$1.25 per person.

The Southern Minnesota Medical Association will present a medal, following its annual custom, to the individual physician who presents the best scientific exhibit at this meeting. Judges will be selected from among distinguished out-of-state visitors. The award will be made at the Annual Banquet, Tuesday night.

Guest Speakers: In accordance with an established precedent, several special societies are sponsoring visiting guest speakers for this meeting. We are indebted, this year, to the following societies:
The Minnesota Radiological Society: Speaker—Bernard H. Nichols, Cleveland, will deliver the society's annual Russell D. Carman Lectureship in radiology.

Northwestern Pediatric Society: Speaker—Paul Louis Schroeder, Chicago.

The Society of Internal Medicine: Speaker—Norman Jolliffe, New York.

The Northern Minnesota Medical Association: Speaker—Harry E. Mock, Chicago.

The Trudeau Society: Speaker—Anthony J. Lanza, New York.

Other speakers appear at the invitation of the Committee on Scientific Assembly.

Open House: All physicians, visitors and their wives will be guests of the Mayo Clinic and the Olmsted-Houston-Fillmore-Dodge County Medical Society at an Open House to be held Monday night, 7:00 p. m. in the Arena at the Mayo Civic Auditorium. Exhibits will be open for inspection and there will be music and special entertainment. Refreshments will be served.

Medical Women's Luncheon: The American Medical Women's Association, Minnesota Branch, will hold a luncheon meeting at the Mayo Foundation House, Monday noon, April 22. All women physicians are invited. Make reservations in advance through Della G. Drips, Mayo Clinic. There will be no charge for this luncheon.

Alumni Dinner: The Minnesota Medical Alumni will hold its annual reunion dinner at 6 p. m. Monday, April 22, in the Kahler Cafe. Tickets at the Registration Desk. Price \$1.25 per person.

Museum: The Mayo Foundation Museum of Hygiene and Medicine, directly across from the Mayo Clinic Building, will be open each day to members and visitors. Hours: 9 a. m. to 12 m. and 1:30 p. m. to 5 p. m.

Physical Therapy Demonstration: There will be demonstrations of Physical Therapy by F. H. Krusen and his staff Monday, April 22, at 10 a. m. and 3 p. m. at the Museum. The Museum lecture room will accommodate only 50 persons, and those who wish to attend should make reservations in advance with F. H. Krusen, Mayo Clinic, Rochester.

Tour and Demonstration at the Institute of Experimental Medicine of the Mayo Foundation: Tours of the Institute and demonstrations of its work have been arranged for Monday, April 22, at 10 a. m. and 3 p. m. Reservations should be made in advance with F. C. Mann at the Institute, Rochester.

PROGRAM—87TH ANNUAL SESSION

Approximately 40 can be accommodated for each tour. Buses leave the Kahler hotel at 9:45 a. m. and 2:45 p. m.

Minnesota Radiological Society: A dinner in honor of Bernard H. Nichols, Carman Lecturer, will be given by the Minnesota Radiological Society at the Kahler hotel cafe Tuesday evening at 6:30 p. m.

Hotels: See enclosed folder for list of Rochester hotels with rates, locations and application blank for accommodations. Detach application blank, fill out and mail. The clerk will forward your application promptly if accommodations are not available at the Hotel of your first choice.

Golf: The annual Golf Tournament of the Minnesota State Medical Association will be held Sunday, April 21, 1 p. m. at the Rochester Country Club, weather permitting.

This is one of the finest golf courses in the country and all medical golfers are urged to participate provided the greens are open. Registrations should be made in advance with J. W. Kernohan, Mayo Clinic, Rochester. Attractive prizes have been donated for the winners.

GUEST SPEAKERS

Paul Budd Magnuson is Associate Professor of Surgery at Northwestern University and attending surgeon at Passavant Memorial and Wesley Memorial Hospitals, Chicago.

Harry E. Mock is Associate Professor of Surgery at Northwestern University, Senior Surgeon at Saint Luke's Hospital, Chicago, and chairman of the Council on Physical Therapy of the American Medical Association.

Fred Lyman Adair is Professor of Obstetrics and Gynecology at the University of Chicago, Chief of Service at the Chicago Lying-In Hospital, and Chairman of the American Committee on Maternal Welfare, the Committee on Prenatal and Maternal Care, White Conference on Child Health, and the American Congress on Obstetrics and Gynecology.

Norman Jolliffe is Associate Professor of Medicine at New York University College of Medicine and Chief of the Medical Service in the Psychiatric Division of Bellevue Hospital.

Bernard H. Nichols is President of the Radiological Society of North America, Chancellor of the American College of Radiology and roentgeneologist at the Cleveland Clinic in Cleveland, Ohio.

Nathan B. Van Etten is President of the American Medical Association, Medical Director, Consulting Physician, and President of the Morrisania City Hospital; President and Visiting Physician at the Union Hospital and Past President and Trustee of the Medical Society of the State of New York.

Paul Louis Schroeder is Director of the Institute of Juvenile Research, criminologist for the State of Illinois, author of several books on juvenile delinquency. He is now engaged in a study, in cooperation with the Department of Pediatrics of the University of Illinois, on emotional aspects of physical disease.

Russell L. Cecil is Professor of Clinical Medicine, Cornell University Medical School, Professor of Medicine, Polyclinic Medical School and Hospital, Associate and Attending Physician, New York and Bellevue Hospitals, Consultant in Medicine, New York Infirmary of Women and Children, Nyack Hospital, Nyack, New York, and Saint Mary's Hospital, Passaic, New Jersey, and Chairman of the New York State and New York City Committees on Pneumonia Control.

Mr. Bernard H. Ridder is publisher of the *Saint Paul Dispatch and Pioneer Press*.

Hon. Harold E. Stassen is Governor of Minnesota.

Anthony J. Lanza is Assistant Medical Director of the Metropolitan Life Insurance Company, Consulting Surgeon of the United States Bureau of Mines and Medical Consultant to the General Motors Corporation. He has conducted special research in industrial hygiene and occupational diseases and especially in the diseases due to inhalation of dusts.

John O. Bower is Director of the Department of Surgical Research, Temple University, Chief Surgeon to the Philadelphia General, Saint Luke's and Children's and Northeastern Hospitals of Philadelphia and Director of the Foundation for Clinical and Surgical Research. Since 1933 he has been Chairman of the Commission on Acute Appendicitis Mortality of the Medical Society of the State of Pennsylvania, and he is originator of the Philadelphia Plan for the Reduction of Appendicitis Mortality.

BUSINESS PROGRAM

Kahler Hotel

Sunday, April 21

3:00 P.M.—CouncilUniversity Club

4:00 P.M.—Reference Committees

7:30 P.M.—House of Delegates.....Sun Room

Address: An American Health Program
NATHAN B. VAN ETEN, President, American Medical Association

President's Address: B. S. ADAMS, President, Minnesota State Medical Association

Greetings: RAYMOND G. ARVESON, President, State Medical Society of Wisconsin

Monday, April 22

7:30 A.M.—CouncilUniversity Club

12:15 P.M.—House of Delegates.....Cafe

Tuesday, April 23

7:30 A.M.—CouncilUniversity Club

Wednesday, April 24

7:30 A.M.—CouncilUniversity Club

10:45 A.M.—Installation of Officers.....
Mayo Civic Auditorium

SCIENTIFIC PROGRAM

Monday, April 22

Morning Session

- A. M.
- 8:00 Visit Scientific and Technical Exhibits
- 8:30 Scientific Cinema.....North Room
Fistulectomy
L. A. BUIE.....Rochester
- 9:00 What's Wrong with the Patient Who is Always Tired?
W. C. ALVAREZ.....Rochester
- 9:15 Facts and Assumptions Regarding the Endocrine Glands
E. H. RYNearson.....Rochester
- 9:30 Medical and Surgical Treatment of Prostatism
G. J. THOMPSON.....Rochester
- 10:00 What's New in Cancer Research?
W. C. MACCARTY.....Rochester

(Intermission)

- 10:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific CinemaNorth Room
The Management of Diabetes
R. M. WILDER.....Rochester
- 11:00 The Sulfamido Compounds: Their Practical Applications in Clinical Medicine
A. E. BROWN.....Rochester
- 11:15 Practical Hints on the Use of Vitamin Preparations
R. M. WILDER.....Rochester
- 11:30 Recent Advances in the Treatment of Diseases of the Liver
A. M. SNELL.....Rochester
- 11:45 Proctological Problems We Don't Like to Discuss
L. A. BUIE.....Rochester
- 12:15 **Round Table Luncheons**
Roentgen Therapy for Inflammatory Conditions
A. U. DESJARDINS.....Rochester
Management of Nephritis
N. M. KEITH.....Rochester
M. W. BINGER.....Rochester
Treatment of Peritonitis
J. M. WAUGH.....Rochester
Oxygen Therapy
W. M. BOOTHBY.....Rochester
W. R. LOVELACE.....Rochester
Arthritis
RUSSELL L. CECIL.....New York City
P. S. HENCH.....Rochester
C. H. SLOCUMB.....Rochester
Anesthesia
J. S. LUNDY.....Rochester
E. B. TUOHY.....Rochester
Peripheral Vascular Disease
E. V. ALLEN.....Rochester
N. W. BARKER.....Rochester

- Diseases of the Blood and Their Treatment
C. H. WATKINS.....Rochester
B. E. HALL.....Rochester
M. M. HARGRAVES.....Rochester
Diagnosis and Management of Common Skin Lesions
P. A. O'LEARY.....Rochester
Management of Urinary Tract Infections
J. L. EMMETT.....Rochester
E. N. COOK.....Rochester
T. L. POOL.....Rochester
Refraction
A. D. PRANGEN.....Rochester

Afternoon Session

- P. M.
- 1:30 Visit Demonstrations, Scientific and Technical Exhibits
Scientific CinemaNorth Room
Recent Traumatic Deformities of the Face
G. B. NEW.....Rochester
- 2:15 Symposium on Chronic Backache and Sciatica Caused by Protruded Intervertebral Disk
M. N. WALSH.....Rochester
J. D. CAMP.....Rochester
J. G. LOVE.....Rochester
- 2:45 **Mayo Foundation Lecture**
Present Trends in the Study of Arthritis and Rheumatism
RUSSELL L. CECIL.....New York City
Professor of Clinical Medicine Cornell University

(Intermission)

- 3:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema.....North Room
Complete Rectal Prolapse (Surgical Repair)
C. W. MAYO.....Rochester
- 4:00 Gastric Cancer Masquerading as Benign Disease; Differential Diagnosis; Surgical Treatment
G. B. EUSTERMAN.....Rochester
WALTMAN WALTERS.....Rochester
- 4:20 Symposium on Diagnosis and Treatment of Chest Tumors
H. J. MOERSCH.....Rochester
H. M. WEBER.....Rochester
S. W. HARRINGTON.....Rochester
- 4:50 A Recently Recognized Type of Headache; Diagnosis and Treatment
B. T. HORTON.....Rochester

Evening—7:00 P. M.

- Open House....Arena, Mayo Civic Auditorium
Music, Floor Show, Refreshments
The Mayo Clinic and the Olmsted-Houston-Fillmore-Dodge County Medical Society will be hosts

PROGRAM—87TH ANNUAL SESSION

Tuesday, April 23

Morning Session

A. M.

- 8:00 Visit Scientific and Technical Exhibits
- 8:30 Scientific CinemaNorth Room
Hay Fever
L. E. PRICKMAN.....Rochester
- 9:00 **Fractures**
Presiding: R. C. WEBB, Minneapolis
Elbow Joint
M. H. TIBBETTS.....Duluth
Ankle
M. O. OPPEGAARD.....Crookston
Os Calcis
O. W. YOERG.....Minneapolis
- 9:45 Fracture of the Neck of the Femur
PAUL B. MAGNUSON.....Chicago, Ill.
Associate Professor of Surgery, North-
western University Medical School

(Intermission)

- 10:15 Visit Demonstrations, Scientific and Tech-
nical Exhibits
Scientific Cinema.....North Room
Treatment of Scarlet Fever (in color)
F. E. SCHMIDT.....Chicago, Ill.

11:00 **Pre-operative Care**

- Surgery of the Biliary Tract
E. M. JONES.....Saint Paul
Preparation of the Diabetic Patient
A. H. BEARD.....Minneapolis
Surgery of the Stomach
N. H. BAKER.....Fergus Falls

- 11:30 Skull Fractures and Cerebral Injuries
HARRY E. MOCK.....Chicago, Ill.
Associate Professor of Surgery, North-
western University Medical School

12:15 **Round Table Luncheons**

- Chemotherapy (Sulfanilamide, etc.)
W. W. SPINK.....University of Minnesota
Office Gynecology
J. J. SWENDSON.....Saint Paul
Management of Associated Injuries with
Cranio-cerebral Injuries
HARRY E. MOCK.....Chicago
Medical Management of Gall Bladder
Disease
E. T. HERRMANN.....Saint Paul
Diseases of the Kidney from a Diagnostic
Standpoint
BERNARD H. NICHOLS.....Cleveland
Allergy
A. A. WHITE.....Minneapolis
Management of Peptic Ulcer
O. H. WANGENSTEEN...University of Minnesota

- Common Diseases of the Rectum
W. A. FANSLER.....Minneapolis
Contributing Causes of Arthritis
PAUL B. MAGNUSON.....Chicago
Care of the Premature
A. V. STOEGER.....University of Minnesota

Afternoon Session

P. M.

- 1:30 Visit Demonstrations, Scientific and Tech-
nical Exhibits
- 1:30 Scientific CinemaNorth Room
Some Practical Pointers on the Treatment
of Intra-Capsular Fractures of the Neck of
the Femur
W. D. WHITE.....Minneapolis

2:15 **Coronary Disease**

- Diagnosis
S. MARX WHITE.....Minneapolis
Electrocardiogram
HARRY OERTING.....Saint Paul
Treatment
F. J. HIRSCHBOECK.....Duluth

- 2:45 Pneumoconiosis
ANTHONY J. LANZA.....New York
Assistant Medical Director Metropolitan
Life Insurance Company

(Intermission)

- 3:15 Visit Demonstrations, Scientific and Tech-
nical Exhibits
Scientific Cinema.....North Room
Open Operation for Chronic Empyema
S. W. HARRINGTON.....Rochester

4:00 **Russell D. Carman Memorial Lecture**

- Indications for the Use of Excretory
Urography in Diagnosis
BERNARD H. NICHOLS.....Cleveland, Ohio
President of the Radiological Society of
North America

- Introduction
L. G. RIGLER.....University of Minnesota

Evening—6:30 P. M.

- Annual Banquet—Rochester State Hospital
Toastmaster: BERTRAM S. ADAMS, President,
Minnesota State Medical Association
Address of Welcome: JOHN DEJ. PEMBERTON,
President, Olmsted-Houston-Fillmore-Dodge
Medical Society
Introduction of Mrs. M. A. NICHOLSON, Duluth,
President, Women's Auxiliary
Presentation of Southern Minnesota Medical
Association Medal
Address: The Honorable HAROLD E. STASSEN,
Governor of the State of Minnesota
How the Peace of the World Was Lost
MR. BERNARD H. RIDDER, Saint Paul
Publisher of the *Saint Paul Dispatch and
Pioneer Press*

PROGRAM—87TH ANNUAL SESSION

Wednesday, April 24

Morning Session

A. M.

- 8:00 Visit Scientific and Technical Exhibits
- 8:30 Scientific Cinema.....North Room
Billroth No. 1 of the Stomach
WALTMAN WALTERS.....Rochester
- 9:00 **Cancer of the Breast**
Diagnosis
E. T. BELL.....University of Minnesota
Treatment by Radical Operation and by Radiation
M. W. ALBERTS.....Saint Paul
- 9:30 Therapeutic Indications for Use of Iron in Treatment of the Anemias
P. F. ECKMAN.....Duluth
- 9:45 Clinical and Surgical Aspects of Spreading Peritonitis Complicating Acute Perforative Appendicitis
JOHN O. BOWER.....Philadelphia, Pa.
Clinical Professor Surgical Research, Temple University

(Intermission)

- 10:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema.....North Room
The Ligation with Injection Treatment of Varicose Veins
H. O. MCPHEETERSMinneapolis

- 10:45 Installation of Officers
- 11:00 Prevention and Treatment of Genital Prolapse
FRED L. ADAIR.....Chicago, Ill.
Professor of Obstetrics and Gynecology, University of Chicago

- 11:30 Clinical Aspects of Vitamin B Deficiencies
NORMAN JOLLIFFE.....New York
Associate Professor of Medicine, New York University College of Medicine

12:15 Round Table Luncheons

Acute Abdominal Emergencies

JOHN O. BOWER.....Philadelphia

Causes and Prevention of Fetal and Neonatal Deaths

FRED L. ADAIR.....Chicago

Prevention of Vitamin Deficiencies in Patients Having Acute Medical and Surgical Diseases

NORMAN JOLLIFFE.....New York City

Otolaryngology in General Practice

L. R. BOIES.....Minneapolis

Health and Delinquency

E. K. CLARKE.....University of Minnesota

PAUL L. SCHROEDER.....Chicago

Refraction and Its Limitations for the General Practitioner

M. C. PFUNDER.....Minneapolis

Treatment of Heart Failure

J. F. BORG.....Saint Paul

Sex Hormones

C. D. CREEVY.....University of Minnesota

R. J. MOE.....Duluth

Management of Diseases of the Prostate

W. E. HATCH.....Duluth

Industrial Health

J. L. MCLEOD.....Grand Rapids

P. M.

1:30 Visit Demonstrations, Scientific and Technical Exhibits

Scientific Cinema.....North Room

Visual Testing in Children

W. H. FINK.....Minneapolis

2:15 Progressive Loss of Vision

Causes of Blindness in Minnesota

C. E. STANFORD.....Minneapolis

Glaucoma

A. C. HILDING.....Duluth

Senile Cataract

E. W. HANSEN.....Minneapolis

Squint in Relation to Loss of Vision

H. W. GRANT.....Saint Paul

3:15 Child Psychiatry

Common Behavior Problems in Pre-School Children

E. K. CLARKE.....University of Minnesota

Mental Hygiene in the School

S. A. CHALLMAN.....Minneapolis

Emotional Factors in Organic Disease

PAUL L. SCHROEDER.....Chicago

Criminologist, State of Illinois, and Director, Institute for Juvenile Research

There is too great a tendency to observe the early lesion in tuberculosis until progression has actually occurred, in which case the maximum opportunity for cure is lost. The purpose of treatment is not only to arrest the peripheral extension of the lesion but also to arrest the process of central caseation. Otherwise, even though temporary arrest may occur later, the central caseous residue constitutes a menace in future years.—J. Burns Amberson, Jr., M.D., Amer. Student Health Assn., Dec. 1939.

* * *

The steps which lead to the establishment of a former tuberculosis patient in a job are extremely important to the patient himself, to his family, to the people with whom he will be working and to the community at large. They are important to the patient because they may determine whether or not he will live. They are important to the patient's family and his future co-workers because, if his disease reactivates, he may infect them. The community is vitally concerned not only from the standpoint of preventing relapses with consequent infection of others, but also from the economic aspect of protecting the thousand or more dollars it has invested in treatment of the patient.—Mrs. Kathryn M. Pearce, Minneapolis, Minnesota.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR APRIL

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program will be as follows:

April 6—Tumors of Stomach

April 13—Tumors of Bowel

April 20—Early Diagnosis of Tuberculosis.

April 27—Tumors of Mouth.

clinic in connection with this course is under consideration.

For further details write J. S. McCartney, M.D., Associate Professor of Pathology.

WABASHA COUNTY SOCIETY

A dinner meeting of the Wabasha County Medical Society was held at the Lake City Hospital on the evening of February 22, to which all physicians in the county and maternity staffs of all hospitals in the county were invited. Dr. B. A. Flesche of Lake City, the regularly appointed representative from this society, gave an outline and stressed the important points of the three-day course of instruction held at the University Center for Continuation Study, February 8, 9 and 10, on the care of the newborn with special reference to prematures.

There were eighteen in attendance, including doctors and nurses.

MAYO CLINIC WEEK

A clinicosurgical week under the direction of The Mayo Foundation will be held at Rochester, Minnesota, May 6 to 11, inclusive. A series of surgical clinics and discussions will be presented with particular emphasis on the treatment of cancer. Visiting physicians are invited to attend.

COURSE IN SURGICAL PATHOLOGY

A course in Surgical Pathology will be given at the University of Minnesota, Department of Pathology, during the first session of summer school, June 17 to July 26, 1940.

This course is designed to give a comprehensive review of the lesions shown in surgical specimens, special emphasis to be laid on the diagnosis of tumors, or lesions which may be confused with tumors. It is arranged according to systems, e.g., gynecology, skin, et cetera. Fixed gross material is used in parallel with slides. Fresh material, as available, is also employed, but obviously may not be strictly applicable to the day's work. X-rays are used in connection with the study of lesions of bones.

About one-third of each class period is devoted to demonstrations on the lantern to show special features. The daily class period is three hours, but for anyone who wishes to do extra work in some field material will be provided.

This course is open to anyone who has finished the regular medical course in pathology, but is especially intended for hospital pathologists and those who wish a course which may aid them in preparing for the examinations of the special boards. Establishment of a

WASHINGTON COUNTY SOCIETY

The regular meeting of the Washington County Medical Society was held March 12, at the Stillwater Club Rooms.

Reports of the meeting of county medical society officers held in Saint Paul in February, dwelling on the care of the indigent and better methods of immunization, were given.

The committee in charge of obtaining donors for blood transfusions stated that members of Post 48, American Legion, will report at the Lakeview Memorial Hospital for grouping and will be on call in case of need.

The chairman of the fracture committee reported the Fracture Symposium of the Hennepin County Medical Society and the Minneapolis Surgical Society of March 7. He called attention to the two motion picture films owned by the Minnesota State Medical Association showing proper first aid and transportation technic for those suffering from fractures of the long bones and demonstrating treatment of fractures of the spine. It was suggested that these films be shown to local firemen, policemen, sheriffs and to any others who might be interested. It was also suggested that inquiry be made into local ambulance service and equipment.

Dr. E. M. Jones, of Saint Paul, gave an illustrated lecture on "The Gallbladder: Its Diseases, Symptomatology, Complications and Treatment." Dr. Jones, who is Counsellor for the Fifth District, discussed the subject of accepting to membership physicians located in neighboring counties, for whom attendance at the Washington County meetings would be more convenient.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of February 14, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 14, 1940. Dinner was served at 7 o'clock and the meeting was called to order by the president, Dr. James Johnson, at 8:15 p. m.

There were forty-seven members and two guests present.

Minutes of the January meeting were read and approved.

Upon ballot the following men were elected as candidates for active membership in the Academy:

Dr. Philip Donohue and Dr. John Holt of Saint Paul, and Dr. William A. Hanson and Dr. O. S. Wyatt, of Minneapolis.

The scientific program followed.

DR. S. E. SWEITZER, Minneapolis, showed a general group of colored kodachrome pictures of skin diseases.

Discussion

DR. H. E. MICHELSON, Minneapolis: It is very difficult to discuss a presentation like Dr. Sweitzer's. We are only able to comment that his slides are very instructive, and that this Will Rogers of medicine has furnished us with much amusement. However, in spite of his facetious remarks, the work represented in this collection is great, and I am sure that as time goes on his collection will become more and more valuable.

LIP AND PALATE OPERATIONS

(Movies in color)

HARRY P. RITCHIE, M.D.

Saint Paul

Dr. Ritchie discussed some of the problems of repair of the congenital clefts of the face and jaw, showing movies in color of operations for several combinations of clefts of the lip, hard palate and soft palate. The main point of this presentation was that the principal thing in any given case, as they came in one after the other, is not the condition of the lip or the palate, but the condition of the alveolar process, whether it is normal or whether it is cleft. This fact has already been indirectly indicated since the beginning of the literature by the terms, "complete and incomplete cleft palate."

Through the interest and direction of Drs. Scammon, Boyden and Jackson of the Department of Anatomy and Embryology of the University of Minnesota, Dr. Ritchie has been able to demonstrate that, from an embryological viewpoint, the process is not a part of the palate but, on the other hand, is formed in relation to the lip. He pointed out that the only cleft requiring early treatment is the cleft in the process, because this cleft is in the bone, and it must receive attention as early as possible while the bone is soft and pliable. If the case with the cleft in the process is allowed to

go beyond the three-month period, the bones become set in their cleft position and it becomes increasingly difficult to contact the edges. For several years, in the treatment of alveolar process clefts, Dr. Ritchie used the wires and plates suggested by Dr. Brophy, thus applying direct force to the bone. He has now completely and irrevocably discontinued such procedures, because there is no way of determining the amount of force applied to the individual case, with the result that the upper jaw is malformed, with malocclusion with the lower jaw on one side or the other. This produces a surgical deformity which sometimes seems worse than the congenital deformity. To substitute the plan, Dr. Ritchie now tries to get all the cases with alveolar process clefts as early as possible and he applies indirect force by means of adhesive straps and rubber bands, gradually narrowing the cleft in the process by indirect force, with most satisfactory results. So soon as the process cleft can be narrowed down 4 to 6 m.m. in width, the lip is done over the process cleft to complete the closure.

Another advance in recent years has been the operation in which the front part of the hard palate is closed at the same time as the lip. This can only be done to the extent of two or three stitches but it does facilitate the subsequent repair of the hard and soft palates, which is usually done some time in the second year.

The lip operation was shown as performed in two ways: first, by electrical stimulation of the muscle bundles of the orbicularis oris, puckering these up to find the lower bundles at the vermilion border and the upper bundles at the base of the ala. These were then sutured together, supplemented by a third stitch between the upper and lower stitches, thus burying the stitches in the body of the lip, and tying them on the mucous membrane side. The same operation was then done by the use of calipers, taking as a starting point an obtuse angle which always is present in unilateral clefts, this point being the natural union of the prolabium of the fronto-nasal process and the maxillary process, right or left, to which it is normally united. Dr. Ritchie believes that the lip can be done without either electrical stimulation or calipers, because he believes that the position of the muscle bundles is always indicated by markings on the skin of the lip.

The bilateral cleft of the lip was shown in which one side is done at one sitting, making an effort to bring the muscle bundles of the lateral maxillary process to the midline of the prolabium, in which there is no muscle tissue. Then, at a period of six weeks to two months, the other side is done, making an effort to bring the muscle bundles of that side to the midline of the prolabium. Both sides of the bilateral lip being done at one sitting has now been discarded, because of the great precision and the time of operation required

to make proper contact. The prolabium of the fronto-nasal process is then placed in the body of the lip. This is a point of procedure upon which there is still no agreement. In support of the plan, Dr. Ritchie presented a case of cleft lip in which everything had completely united except a few muscle bundles on the left side which had failed to contact, being attached only to the skin margins and causing a line of depression in the skin, just the markings of the normal line of union. The outlines of the prolabium in this case were very evident and showed that it was a part of the normal lip and that the vermilion border of the prolabium was a part of the vermilion border of the normal lip.

Discussion

DR. ARNOLD SCHWYZER, Saint Paul: I don't know that I feel prepared to discuss these beautiful pictures except that I want to congratulate Dr. Ritchie on having made and shown them. This is a very special field and it takes a special dexterity to do these things. Dr. Ritchie several times has shown, when I saw him work, an extraordinary dexterity. I cannot help saying, though, that it is a little difficult always to see well when you have moving pictures in surgery. These are probably as good as any I have seen. Evidently the big field for colored pictures is dermatology, for they must be wonderful for teaching purposes.

The meeting adjourned.

A. G. SCHULZE, M.D., *Secretary*.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*

MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

At the regular meeting of the *Washington County* Auxiliary held at the home of Mrs. E. Sydney Boleyn, plans were made for the completion of a poster showing the progress of the auxiliary during the year. This poster will be sent to the state meeting which will be held in Rochester, Minnesota, in April.

Park Region Auxiliary and Medical Society held a joint meeting in Fergus Falls at the State hospital, Wednesday, February 14. About seventy-five attended the dinner, after which members of the Auxiliary adjourned to the home of Dr. and Mrs. W. L. Patterson for their business session. The annual meeting of the Auxiliary will be held in April, when a new president will be elected.

The *Renville County* Auxiliary met for their February session with the following members attending: Mrs. R. Madland and Mrs. C. Hartman of Fairfax, Mrs. J. Dordahl of Sacred Heart, Mrs. R. Adams of Bird Island, Mrs. G. H. Mesker, Mrs. A. A. Passer and Mrs. J. A. Cosgriff of Renville. A book review was given by Mrs. Dordahl of Sacred Heart.

Mrs. D. G. Mahle of Plainview, Minnesota, was elected president of the *Wabasha County* Medical Auxiliary at the annual meeting held at the home of Mrs. C. G. Ochser. Mrs. Mahle succeeds Mrs. B. A. Flesche of Lake City. The newly elected vice president is Mrs. B. J. Bouquet of Wabasha and the new secretary and treasurer is Mrs. M. J. Campion of Lake City. Mrs. Race of Plainview was named scrapbook chairman. Following the election a luncheon was served.

The *Winona County* Auxiliary will send their newly elected president to the annual state meeting to be held in Rochester in April. This Auxiliary will hold their annual meeting in April. A recent meeting was called by the President, Mrs. H. W. Satterlee of Lewiston, and was followed by a luncheon held at the Garden Gate and attended by sixteen members.

The *Winona* Auxiliary has contributed this year to the school milk fund and to the purchase of *Hygeia*, which was donated to three Winona high schools and the high schools of Rollingstone, Lewiston and St. Charles. The Auxiliary has been very active this year in the Cancer Campaign.

Have you made your hotel reservation for the 18th Annual Convention of the Woman's Auxiliary to the American Medical Association, which will be held in New York City, June 10 to 14, 1940? Headquarters are at the Hotel Pennsylvania and we are sure you will not want to miss this convention, which promises to be an outstanding one. *Mail Your Reservation Today* to Dr. Peter Irving, Housing Bureau, Room 1036, 233 Broadway, New York City.

* * *

The *Hennepin County* Auxiliary held its last regular meeting March 1, when the group entertained members of other Auxiliaries of the state. A talk on "Spring Gardens" by Mr. Rodney Kelley was given with illustrated moving pictures.

The annual Easter Monday card party will be held on March 25. Money from this is used for philanthropic needs with the larger part of the money raised used for the personal needs of the extuberculosis patients who are living at Sarahurst—the boarding home supported by the Christmas Seal Sale. Contributions are made each year to the upkeep of "our room" which houses three girls. The parties each year are held in private homes as well as in the Medical Library. The following members will open their homes: Mmes. E. D. Anderson, E. W. Bedford, E. G. Benjamin, James Blake, L. R. Boies, A. E. Cardle, J. B. Carey, R. R. Craumer, C. D. Creevy, Peter E. Peterson, E. T. Evans, G. M. Hall, W. K. Haven, E. C. Henrikson, R. T. LaVake, C. O. Maland, Russell Morse, J. A. Myers, E. G. Oppen. The general chairman for these parties is Mrs. L. S. Arling.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

NEWER NUTRITION IN PEDIATRIC PRACTICE. I. Newton Kugelmass, B.S., M.A., M.D., Ph.D., Sc.D. Attending Pediatrician, Broad St. Hospital and Heckscher Institute, New York; Consulting Pediatrician Lynn Memorial Hospital, Monmouth Memorial Hospital and Muhlenberg Hospital, New Jersey, etc. 1155 pages. Illus. Price, cloth, \$10.00. Philadelphia: J. B. Lippincott Co., 1940.

THE MANAGEMENT OF OBSTETRIC DIFFICULTIES. Paul Titus, M.D. Obstetrician and Gynecologist to St. Margaret Memorial Hospital, Pittsburgh; Consulting Obstetrician and Gynecologist, Pittsburgh City Homes and Hospital, Mayview, and to Homestead Hospital, Homestead, Pa. Secretary, American Board of Obstetrics and Gynecology. 968 pages. Illus. Price, cloth, \$10.00. St. Louis: C. V. Mosby Co., 1940.

TEN YEARS IN THE CONGO. W. E. Davis, M.D. 301 pages. Price, cloth, \$2.50. New York: Reynal & Hitchcock, 1940.

HEIL HUNGER! Health under Hitler. Dr. Martin Gumpert. Translated from the German by Maurice Samuel. 129 pages. Price, cloth, \$1.75. New York: Alliance Book Corporation, 1940.

NON-PROFIT HOSPITAL SERVICE PLANS. C. Rufus Rorem, Ph.D., C.P.A. Director, Commission on Hospital Service, American Hospital Assn., Chicago. 130 pages. Price, paper cover, single copies 50c each; lots of 4 to 10, 25c each; 11 or more, 15c each. Chicago: Commission on Hospital Service, 1940.

SHOCK—Blood Studies as a Guide to Therapy. John Scudder, M.D., Med. Sc.D., F.A.C.S. From the Surgical Pathology Laboratory of the College of Physicians and Surgeons, Columbia University, and Department of Surgery, Presbyterian Hospital, New York City. 315 pages. Illus. Price, cloth, \$5.50. Philadelphia: J. B. Lippincott Co., 1940.

PNEUMOCONIOSIS—The Story of Dusty Lungs. A Preliminary Report. Lewis Gregory Cole, M.D., Director of Silicotic Research, John B. Pierce Foundation, New York, and William Gregory Cole, M.D. 100 pages. Illus. Price, cloth, \$1.00. New York: John B. Pierce Foundation, 1940.

PRECLINICAL MEDICINE. Malford W. Thewlis, M.D., Attending Specialist, General Medicine, United States Public Health Hospitals, New York City; Special Consultant, Rhode Island Department of Health; Associate Editor, Medical Times (New York), etc. 223 pages. Illus. Price, cloth, \$3.00. Baltimore: Williams & Wilkins Co., 1940.

GOOD HEALTH AND BAD MEDICINE. A Family Medical Guide. Harold Aaron, M.D., Medical Consultant to

Consumers Union of United States, Inc. 328 pages. Price, cloth, \$3.00. New York: Robert M. McBride & Co., 1940.

PHYSICAL DIAGNOSIS (Elmer and Rose). Eighth Edition. Revised by Harry Walker, M.D., F.A.C.P. Associate Professor of Medicine, Medical College of Virginia, Richmond, Va. 792 pages. Illus. Price, cloth, \$8.75. St. Louis: C. V. Mosby Co., 1940.

ESSENTIALS OF THE DIAGNOSTIC EXAMINATION. John B. Youmans, B.A., M.S., M.D. Associate Professor of Medicine and Director of Postgraduate Instruction, Vanderbilt University Medical School. 417 pages. Illus. Price, cloth, \$3.00. New York: The Commonwealth Fund, 1940.

DISEASES OF THE NOSE AND THROAT. Charles J. Imperatori, M.D., and Herman J. Burman, M.D. 2nd edition. 726 pages. Illus. Price, \$7.00. Philadelphia: J. B. Lippincott Company, 1939.

Though the first edition is only three years old, the authors have seen fit to issue a second edition of this work. This evidences a desire to keep the book abreast of recent advances in this field. Considerable new material is found in this second edition. Of this may be mentioned the newer knowledge of nasal allergy. The authors have also given attention to recent work on the physiology of the nose in bringing this section up to date. Acute laryngo-tracheo-bronchitis, a recently recognized entity, is discussed.

The same style and arrangement is followed which renders the material readily available. The paper and type are the best. The authors have followed their original plan of omitting controversial material and presenting salient facts and proven methods of therapy with little or no critical comment of other methods.

Though originally presented in the form of lectures for students, the book is a handy reference work for the practicing rhinologist and laryngologist.—A.G.A.

PSYCHOBIOLOGY AND PSYCHIATRY. A Text-book of Normal and Abnormal Human Behavior. Wendell Muncie, M.D., Associate Professor of Psychiatry, Johns Hopkins University; Assistant Psychiatrist, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital. Pp. 729. Illus. 69. Price \$8.00. St. Louis: C. V. Mosby Company.

The author is a member of the staff of the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital. Dr. Adolph Meyer, Director of the Clinic, introduces the book with a foreword; he commends the author of the text because "he would also formulate best what he actually finds in his patients and uses in his teaching and in the service of therapy." In view of the fact that many workers in the field of psychiatry have for

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MINNESOTA MEDICINE

some years past anticipated a textbook exposition by the eminent Director of the Clinic, the following excerpt in the Preface by Muncie is of interest: "This book . . . attempts to give a fair account of the conceptions, teaching and working methods of the Clinic as currently constituted." The text is aimed primarily for the use of students.

Contents are divided into four parts. In the first chapter of Part I the Historical and Philosophical Bases of Psychobiology are outlined. The other three chapters, comprising a total of 92 pages, deal with the Student's Personality Study. Then follow nine chapters in Part II devoted to Pathology and Psychiatry. Part III concerns Treatment and Part IV is given over to Historical Survey in Bibliography of the Development of the Concepts underlying the Principal Reaction Sets. This last part comprises 182 pages, almost a fourth of the text, a rather liberal space allotment it would seem.

The textbook contains 69 illustrations and an ample index; it deserves recognition as a valuable addition to American psychiatric literature.

J. C. MICHAEL, M.D.

POPULATION, RACE, AND EUGENICS. Morris Siegel, M.D. Published by the author, 546 Barton Street, Hamilton, Ontario, 1939. 206 pages. Price \$3.00.

This book is of interest to laymen and the profession alike, although medical men may question some of the statements made. For instance, epilepsy, in the light of recent advances in this field, is hardly a good

reason for sterilization. The classification of feeble-mindedness is arbitrarily based on the I.Q., which, taken alone, is a doubtful criterion. The number of mentally deranged in this country as given seems to be too high.

More in conformity with the opinion of the best authorities is the chapter on Race. The theory of Nordic superiority based on the pseudo-scientific works of Gobineau and Houston Chamberlain, is refuted. There is no pure race. The cultural heritage of the present day dates back to the Greeks and Romans, and certainly not to the wild nordic tribes. In the Middle Ages, the cultural advances were due to the Moors and Arabs, while the Renaissance was born in the Mediterranean countries.

With regard to population, the author calls attention to the fact that, while the birth rate in this country, as elsewhere, is falling, it is solely at the expense of the cultured urban population. The reproduction in the agricultural regions and among the poor and uneducated in the cities is abnormally high. Since mental derangement and criminality are both affected by environmental factors, it follows that the nation, while being depopulated, becomes tainted at the same time with unfit. Sterilization alone cannot cope with the situation.

Hence, the author advocates restricted marriage, segregation of the unfit during the entire reproductive period for women, and, above all, social reforms such as abolition of slums, broad education for the masses, and other measures of equal importance.

M. L. ZLATORSKI, M.D.

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, *AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES*, Vol. 23, No. 2, pages 201-206, March, 1939.

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E. HAUGSETH, M.D. Twin Valley
ESKIL ERICKSON, M.D. Halstad
G. W. BOHL, M.D. Ada

OLMSTED COUNTY
J. E. CREWE, M.D. Rochester
DORR HALLENBECK, M.D. Rochester
FELIX DOLDER, M.D. Eyota

OTTER TAIL COUNTY
A. J. LEWIS, M.D. Henning
W. L. BURNAP, M.D. Fergus Falls
G. C. JACOBS, M.D. Fergus Falls

PENNINGTON COUNTY
O. F. MELLBY, M.D. Thief River Falls
O. G. LYNDE, M.D. Thief River Falls
H. K. HELSETH, M.D. Thief River Falls

PINE COUNTY
A. K. STRATTE, M.D. Pine City
A. L. ARENDS, M.D. Sandstone
C. G. KELSEY, M.D. Hinckley

PIPESTONE COUNTY
W. G. BENJAMIN, M.D. Pipestone
H. DEBOER, M.D. Edgerton
J. G. LOHMANN, M.D. Jasper

POLK COUNTY
C. L. OPPEGAARD, M.D. Crookston
J. F. NORMAN, M.D. Crookston
S. H. STUURMANS, M.D. Erskine

POPE COUNTY
A. F. GIESEN, M.D. Starbuck
E. A. EBERLIN, M.D. Glenwood
B. I. MCIVER, M.D. Lowry

RED LAKE COUNTY
J. A. ROY, M.D. Red Lake Falls

REDWOOD COUNTY
R. A. PETERSON, M.D. Vesta
T. E. FLINN, M.D. Redwood Falls

RENVILLE COUNTY
J. A. COSGRIFF, M.D. Olivia
F. W. PENHALL, M.D. Morton
W. J. BUSHARD, M.D. Bird Island

RICE COUNTY
S. B. HAESSLY, M.D. Faribault
C. M. ROBILLIARD, M.D. Faribault
C. D. LUFKIN, M.D. Northfield

ROCK COUNTY
C. L. SHERMAN, M.D. Luverne
C. O. WRIGHT, M.D. Luverne
F. W. BOFENKAMP, M.D. Luverne

ROSEAU COUNTY
J. L. DELMORE, M.D. Roseau
N. M. LEITCH, M.D. Warroad
D. O. BERGE, M.D. Roseau

ST. LOUIS COUNTY
W. A. COVENTRY, M.D. Duluth
C. H. SCHRODER, M.D. Duluth
P. G. BOMAN, M.D. Duluth

SCOTT COUNTY
C. J. OLSON, M.D. Belle Plaine
B. F. PEARSON, M.D. Shakopee
H. D. NAGEL, M.D. Waconia

SHERBURNE COUNTY
A. B. ROEHLKE, M.D. Elk River
E. F. CLOTHIER, M.D. Elk River

SIBLEY COUNTY
W. P. OLSON, M.D. Gaylord
ROLF HOVDE, M.D. Winthrop
THOMAS MARTIN, M.D. Arlington

STEARNS COUNTY
C. F. BRIGHAM, M.D. St. Cloud
A. H. ZACHMAN, M.D. Melrose
WILLIAM FRIESLEBEN, M.D. Sauk Rapids

STEELE COUNTY
J. A. MCINTYRE, M.D. Owatonna
E. J. NELSON, M.D. Owatonna
L. V. BERGHS, M.D. Owatonna

STEVENS COUNTY
E. T. FITZGERALD, M.D. Morris
C. E. CAINE, M.D. Morris
M. L. RANSOM, M.D. Hancock

SWIFT COUNTY
HANS JOHNSON, M.D. Kerkhoven
W. C. KAUFMAN, M.D. Appleton
C. L. SCOFIELD, M.D. Benson

TODD COUNTY
M. E. MOSBY, M.D. Long Prairie
J. M. COOK, M.D. Staples
W. W. WILL, M.D. Bertha

TRAVERSE COUNTY
C. F. EWING, M.D. Wheaton
N. F. DOLEMAN, M.D. Tintah
A. L. LINDBERG, M.D. Wheaton

WABASHA COUNTY
E. C. BAYLEY, M.D. Lake City
C. G. OCHSNER, M.D. Wabasha
D. G. MAHLE, M.D. Plainview
W. T. COCHRANE, M.D. Lake City

WADENA COUNTY
C. H. PIERCE, M.D. Wadena
L. T. DAVIS, M.D. Wadena
A. H. BORGESON, M.D. Sebeka

WASECA COUNTY
B. J. GALLAGHER, M.D. Waseca
R. O. SPITTLER, M.D. New Richland
R. C. HOTTINGER, M.D. Janesville

WASHINGTON COUNTY
W. R. HUMPHREY, M.D. Stillwater
E. V. STRAND, M.D. Bayport
J. W. STUHR, M.D. Stillwater

WATONWAN COUNTY
ALBERT THOMPSON, M.D. St. James
H. B. GRIMES, M.D. Madelia
O. E. HAGEN, M.D. Butterfield

WILKIN COUNTY
L. H. MCMAHON, M.D. Breckenridge
W. E. WRAY, M.D. Campbell
E. W. RIMER, M.D. Breckenridge

WINONA COUNTY
C. P. ROBBINS, M.D. Winona
E. E. CHRISTENSEN, M.D. Winona
L. I. YOUNGER, M.D. Winona

WRIGHT COUNTY
W. E. HART, M.D. Monticello
L. H. BENDIX, M.D. Annandale
T. J. CATLIN, M.D. Buffalo

YELLOW MEDICINE COUNTY
A. G. SANDERSON, M.D. Granite Falls
R. H. KATH, M.D. Wood Lake
M. I. HAUGE, M.D. Clarkfield
G. M. TANGEN, M.D. Canby

(No committees have been appointed in the following counties:
Cook, Lake of the Woods.)

Women's Auxiliary

to the

Minnesota State Medical Association

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MRS. W. W. MOIR.....	<i>Auditor</i>	Minneapolis
MRS. E. C. ESHELBY.....	<i>Parliamentarian</i>	St. Paul
MRS. J. B. GAIDA.....	<i>Historian</i>	St. Cloud

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DISTRICT NO. 1

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 Counties—Dodge, Fillmore, Freeborn, Goodhue,
 Houston, Mower, Olmsted, Rice, Steele, Wabasha,
 Winona.

DISTRICT NO. 2

L. L. SOGGE, M.D.....Windom
 Counties—Cottonwood, Faribault, Jackson, Martin,
 Murray, Nobles, Pipestone, Rock, Watonwan.

DISTRICT NO. 3

B. J. BRANTON, M.D.....Willmar
 Counties—Big Stone, Brown, Chippewa, Kandiyohi,
 Lac Qui Parle, Lincoln, Lyon, Meeker, Pope, Red-
 wood, Stevens, Swift, Traverse, Yellow Medicine.

DISTRICT NO. 4

A. E. SOHMER, M.D.....Mankato
 Counties—Blue Earth, Carver, LeSueur, McLeod,
 Nicollet, Renville, Scott, Sibley, Waseca.

DISTRICT NO. 5

E. M. JONES, M.D.....St. Paul
 Counties—Anoka, Chisago, Dakota, Isanti, Kanabec,
 Mille Lacs, Pine, Ramsey, Sherburne, Washington

DISTRICT NO. 6

C. A. STEWART, M.D.....Minneapolis
 Counties—Hennepin, Wright

DISTRICT NO. 7

E. J. SIMONS, M.D.....Swanville
 Counties—Aitkin, Beltrami, Benton, Cass, Clearwater,
 Crow Wing, Hubbard, Koochiching, Morrison,
 Stearns, Todd, Wadena.

DISTRICT NO. 8

W. L. BURNAP, M.D.....Fergus Falls
 Counties—Becker, Clay, Douglas, Grant, Kittson,
 Lake of the Woods, Mahnomen, Marshall, Norman,
 Otter Tail, Pennington, Polk, Red Lake, Roseau,
 Wilkin.

DISTRICT NO. 9

F. J. ELIAS, M.D.....Duluth
 Counties—Carlton, Cook, Itasca, Lake, St. Louis.

MINNESOTA STATE MEDICAL ASSOCIATION

COUNTY SOCIETY ROSTER

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month

Annual meeting in December

Number of Members: 34

President
Hassett, R. G. Mankato

Secretary
Troost, H. B. Mankato

Andrews, R. N. Mankato
Benham, E. W. Mankato
Black, William. Mankato
Butzer, J. A. Mankato
Dahl, G. A. Mankato
Denman, A. V. Mankato
Edwards, R. T. Elysian
Franchere, F. W. Lake Crystal

Fugina, G. R. Mankato
Gunlaugson, F. G. Mankato
Hankerson, R. G. Minnesota Lake
Hassett, R. G. Mankato
Holbrook, J. S. Mankato
Howard, M. L. Mankato
Huffington, H. L. Mankato
Jones, O. H. Madison Lake
Juliar, R. O. St. Clair
Kaufman, W. B. Mankato
Liedloff, A. G. Mankato
Lloyd, H. J. Mankato
Macbeth, J. L. St. Clair

Mickelson, J. C. Mankato
Miller, V. I. Mankato
Morgan, H. O. Amboy
*Osborn, Lida. Mankato
Penn, G. E. Mankato
Samuelson, L. G. Mankato
Schlesselman, J. T. Mankato
Schmidt, P. A. Good Thunder
Sohmer, A. E. Mankato
Stillwell, W. C. Mankato
Troost, H. B. Mankato
Vezina, J. C. Mapleton
Wentworth, A. J. Mankato
Williams, H. O. Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties

Regular meetings, first Thursday of February, May, August and November

Annual meeting, first Thursday in November

Number of Members: 36

President
Vaughan, V. M. Truman

Secretary
Mills, J. L. Winnebago

Bailey, H. B. Fairmont
Barr, W. H. Wells
Bergen, C. T. Blue Earth
Blanchard, H. G. Fairmont
Boysen, Herbert. Welcome
Chambers, W. C. Blue Earth
Cooper, M. D. Winnebago
Demo, P. W. Wells
Farrish, R. C. Sherburn

Fisher, I. I. Ceylon
Gardner, V. H. Fairmont
Havel, T. E. Blue Earth
Heimark, J. J. Fairmont
Henderson, A. J. Kiester
Holm, P. F. Wells
Hunt, R. C. Fairmont
Hunte, A. F. Bylas, Ariz.
*Jacobs, A. C. Elmore
Johnson, D. W. Fairmont
Johnson, H. P. Fairmont
Krause, C. W. Fairmont
Luedtke, G. H. Fairmont
Marken, M. H. Fairmont

McGroarty, J. J. Easton
McKean, F. F. Delavan
Miller, H. A. Fairmont
Mills, J. L. Winnebago
Raymond, J. H. Triumph
Rowe, W. H. Fairmont
Russ, H. H. Blue Earth
Sommer, A. W. Elmore
Sybilrud, H. W. Briceyn
Thayer, E. A. Truman
Vaughan, V. M. Truman
Virnig, M. P. Wells
Wilson, C. E. Blue Earth
Zemke, E. E. Fairmont

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties

Annual meeting, March

Number of Members: 26

President
Roust, H. A. Montevideo

Secretary
Westby, Magnus. Madison

Bacon, R. S. Montevideo
Bergh, L. N. Montevideo
Boody, G. J., Jr. Dawson
Burns, F. M. Milan
Burns, M. A. Milan
*Cress, E. E. Boyd

Foshager, H. T. Clara City
Hauge, M. I. Clarkfield
*Hauge, M. M. Clarkfield
Herbert W. L. Granite Falls
Holmberg, L. J. Canby
Hudec, E. R. Echo
Johnson, C. M. Dawson
Jordan, L. S. Granite Falls
Kath, R. H. Wood Lake
Kaufman, W. C. Appleton
Lee, W. N. Madison

Lima, Ludvig. Montevideo
Nelson, M. S. Granite Falls
Pertl, A. L. Canby
Roust, H. A. Montevideo
Sanderson, A. G. Granite Falls
Schmidt, P. G., Jr. Granite Falls
Smith, L. G. Montevideo
Swezey, B. F. Bellingham
Tangen, G. M. Canby
Westby, Magnus. Madison
Westby, Nels. Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Annual meeting, December

Number of Members: 24

President
Seitz, S. B. Barnesville

Secretary
Flancher, L. H. Lake Park

Aborn, W. H. Hawley
Bottolfson, B. T. Moorhead
Carman, J. E. Detroit Lakes
Duncan, J. W. Moorhead
Ellingson, A. R. Detroit Lakes

Flancher, L. H. Lake Park
Gosslee, G. L. Moorhead
Gunderson, R. M. Lake Park
Hagen, O. J. Moorhead
Haight, G. G. Audubon
Herbst, R. F. Toite
Humphrey, E. W. Moorhead
Ingebrigtsen, E. K. G. Moorhead
Larsen, O. O. Detroit Lakes
Larsen, Arnold. Detroit Lakes

Moberg, C. W. Detroit Lakes
Rice, H. G. Moorhead
Rutledge, L. H. Detroit Lakes
Seitz, S. B. Barnesville
Simison, Carl. Barnesville
Simison, C. W. Hawley
Stafne, W. A. Moorhead
Thysell, F. A. Moorhead
Thysell, V. D. Hawley

DAKOTA COUNTY MEDICAL SOCIETY

Acting Secretary

Peck, L. D. Hastings

Peck, L. D. Hastings

Peck, L. R. Hastings

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties

Annual meeting, December

Number of Members: 36

President
Vik, Melvin. Onamia

Secretary
Nordman, W. F. Mora
Arends, A. L. Sandstone

*Deceased

Blomberg, W. R. Princeton
Blumenthal, J. S. Columbia Heights
Bossert, C. S. Mora
Brink, D. M. Isle
Brownstone, Manuel. Sandstone
Bunker, B. W. Anoka
Callahan, F. F. Pokegama

Cooney, H. C. Princeton
Dedolph, T. H. Braham
Dredge, H. P. Sandstone
Feinstein, J. Y. Cambridge
Fredlund, M. L. Milaca
Gardner, W. P. Anoka
Gully, R. J. Cambridge
Halpin, J. E. Rush City

Hedenstrom, L. H.....Cambridge
Holmes, A. E.....Rush City
Kaufman, E. J.....Appleton
Kelsey, C. G.....Hinckley
McBroom, D. E.....Cambridge
Mork, F. E.....Anoka
Neumaier, Arthur.....Lindstrom

Nordman, W. F.....Mora
Nygren, W. T.....Braham
Petersen, P. C.....Braham
Peterson, A. A.....Mora
Roehlke, A. B.....Elk River
Schlesselman, George.....Anoka

Spurzem, R. J.....Anoka
Stephan, E. L.....Hinckley
Stratte, A. K.....Pine City
Swensen, R. G.....North Branch
Tesch, G. H.....Elk River
Trommald, Gladys B. K....Brainerd
Vik, Melvin.....Onamia

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly

Annual meeting, December

Number of Members: 19

President
Palmer, C. F.....Albert Lea
Secretary
Prins, L. R.....Albert Lea
Barr, L. C.....Albert Lea
Burns, H. D.....Albert Lea
Butturff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea

Donovan, D. L.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Albert Lea
Freligh, W. P.....Albert Lea
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A.....Albert Lea
Kaasa, L. J.....Albert Lea

Kamp, B. A.....Albert Lea
Leopard, B. A.....Albert Lea
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Prins, L. R.....Albert Lea
Schultz, J. A.....Albert Lea
Swanson, R. R.....Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none

Annual meeting, December

Number of Members: 22

President
McGuigan, H. T.....Red Wing
Secretary
Juers, E. H.....Red Wing
Aanes, A. M.....Red Wing
Aanes, A. R.....Ellsworth, Wis.
Anderson, S. H.....Red Wing
Brusegard, J. F.....Red Wing

Claydon, D. R.....Red Wing
Claydon, H. F.....Zumbrota
Claydon, L. E.....Red Wing
Flom, M. G.....Zumbrota
Graves, R. B.....Red Wing
Hartnagel, G. F.....Red Wing
Hedin, R. F.....Chicago, Ill.
Johnson, A. E.....Red Wing
Jones, A. W.....Red Wing

Juers, E. H.....Red Wing
Liffrigg, W. W.....Goodhue
Mack, J. J.....Little Rock, Ark.
McGuigan, H. T.....Red Wing
Nordholm, V. W.....Ellsworth, Wis.
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Vaaler, T.....Cannon Falls
Williams, M. R.....Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday each month excepting

June, July, August and September

Annual meeting, October

Number of Members: 641

President
Johnson, J. A.....Minneapolis
Secretary
Daniel, L. M.....Minneapolis
Executive Secretary
Mr. J. H. Baker.....Minneapolis
Aagaard, G. N., Jr.....Minneapolis
Abramson, Milton.....Minneapolis
Adams, J. M.....Minneapolis
Aling, C. P.....Minneapolis
Aling, C. A.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Altnow, H. O.....Minneapolis
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
Anderson, D. D.....Minneapolis
Anderson, E. D.....Minneapolis
Anderson, E. R.....Minneapolis
Anderson, F. J.....Minneapolis
Anderson, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, P. A.....Minneapolis
Anderson, U. S.....Minneapolis
Andreassen, E. C.....Minneapolis
Andrews, R. S.....Minneapolis
Annis, H. B.....Minneapolis
Arey, S. L.....Excelsior
Arlander, C. E.....Minneapolis
Arling, L. S.....Minneapolis
Arnold, Anna W.....Minneapolis
Arnold, D. C.....Minneapolis
Arvidson, C. G.....Minneapolis
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Baken, M. P.....Minneapolis
Baker, A. B.....Minneapolis
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Loe.....Minneapolis
Balkin, S. G.....Minneapolis
Barber, J. P.....Minneapolis
Barron, Moses.....Minneapolis
Bass, G. W.....Minneapolis
Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Beard, A. H.....Minneapolis
Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
Bell, E. T.....Minneapolis

Belzer, M. S.....Minneapolis
Benesh, N. G.....Minneapolis
Benjamin, A. E.....Minneapolis
Benjamin, E. G.....Minneapolis
Benjamin, H. G.....Minneapolis
Benn, F. G.....Minneapolis
Berger, A. G.....Minneapolis
Bergh, G. S.....Minneapolis
Berkwitz, N. J.....Minneapolis
Berman, Reuben.....Minneapolis
Bessesen, A. N., Jr.....Minneapolis
Bessesen, D. H.....Minneapolis
Bessesen, W. A.....Minneapolis
Blake, James.....Hopkins
Blake, J. A.....Hopkins
Blaustone, H. H.....Minneapolis
Blumstein, Alex.....Minneapolis
Bockman, M. W. H.....Minneapolis
Boehme, E. I.....Minneapolis
Boehrer, J. J.....Minneapolis
Boies, L. R.....Minneapolis
Booth, A. E.....Minneapolis
Boreen, C. A.....Minneapolis
Borgeson, E. J.....Minneapolis
Borman, C. N.....Minneapolis
Bouman, H. A. H.....Minneapolis
Boynton, Ruth E.....Minneapolis
Bratrud, A. F.....Minneapolis
Brekke, H. I.....Minneapolis
Brooks, C. N.....Minneapolis
Brown, E. D.....Paynesville
Brutsch, G. C.....Minneapolis
Bryant, F. L.....Minneapolis
Buchstein, H. F.....Minneapolis
Bukley, Kenneth.....Minneapolis
Butler, John.....Minneapolis
Buzzelle, L. K.....Minneapolis
Cable, M. L.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Callerstrom, G. W.....Minneapolis
Cameron, Isabell L.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, L. M.....Minneapolis
Campbell, O. J.....Minneapolis
Cardle, A. E.....Minneapolis
Carey, J. B.....Minneapolis
Carlson, Lawrence.....Minneapolis
Carlson, L. T.....Minneapolis
Caron, R. P.....Minneapolis
Caspers, C. G.....Minneapolis
Cavanor, F. T.....Minneapolis

Challman, S. A.....Minneapolis
Chesley, A. J.....Minneapolis
Christenson, G. R.....Minneapolis
Christianson, H. W.....Minneapolis
Clark, H. S.....Minneapolis
Clay, L. B.....Minneapolis
Cohen, B. A.....Minneapolis
Cohen, S. S.....Oak Terrace
Condit, W. H.....Minneapolis
Cook, H. W.....Minneapolis
Cooperman, H. O.....Minneapolis
Corbett, J. F.....Minneapolis
Cornica, A. D.....Minneapolis
Cottam, G. G.....Minneapolis
Cranmer, R. R.....Minneapolis
Cranston, R. W.....Minneapolis
Creedy, C. D.....Minneapolis
Creighton, R. H.....Minneapolis
Curtin, J. F.....Minneapolis
Cutts, George.....Minneapolis
Dady, E. E.....Minneapolis
Dahl, E. O.....Minneapolis
Dahl, J. A.....Minneapolis
Daniel, D. H.....Minneapolis
Daniel, L. M.....Minneapolis
Dart, L. O.....Minneapolis
Davis, J. C.....Minneapolis
del Plaine, C. W.....Minneapolis
Devereaux, T. J.....Wayzata
Diehl, H. S.....Minneapolis
Diessner, H. D.....Minneapolis
Doering, R. E.....Minneapolis
Dorge, R. I.....Minneapolis
Dornblaser, H. B.....Minneapolis
Dorsey, G. C.....Minneapolis
Doxey, G. L.....Minneapolis
Doyle, L. O.....Minneapolis
Drake, C. R.....Minneapolis
Drill, H. E.....Hopkins
Duff, E. R.....Minneapolis
Dukelow, D. A.....Minneapolis
Dumas, A. G.....Minneapolis
Dunlap, E. H.....Minneapolis
Dunn, G. R.....Minneapolis
Duryea, W. M.....Minneapolis
Dutton, C. E.....Minneapolis
Dvorak, B. A.....Minneapolis
Dwan, P. F.....Minneapolis
Dworsky, S. D.....Minneapolis
Ehrenberg, C. J.....Minneapolis
Ehrlich, S. P.....Minneapolis

Eich, Matthew.....	Minneapolis	Hirschfelder, A. D.....	Minneapolis	Logeifeil, R. C.....	Minneapolis
Eisenstadt, D. H.....	Minneapolis	Hirshfield, F. R.....	Minneapolis	Long, Jesse.....	Minneapolis
Eitel, G. D.....	Minneapolis	Hoaglund, A. W.....	Minneapolis	Loomis, E. A.....	Minneapolis
Ellison, D. E.....	Minneapolis	Hobbs, C. A.....	Minneapolis	Lowry, Elizabeth C.....	Minneapolis
Engelhart, P. C.....	Minneapolis	Hodge, S. V.....	Minneapolis	Lowry, Thomas.....	Minneapolis
Engstrand, O. J.....	Minneapolis	Hoffert, H. E.....	Minneapolis	Lufkin, N. H.....	Minneapolis
Erdmann, C. A.....	Minneapolis	Hoffman, R. A.....	Minneapolis	Lundblad, R. A.....	Minneapolis
Erickson, R. F.....	Minneapolis	Hoffman, W. L.....	Minneapolis	Lundblad, S. W.....	Minneapolis
Ericson, R. M.....	Minneapolis	Holl, P. M.....	Minneapolis	Lundgren, A. C.....	Minneapolis
Evans, E. T.....	Minneapolis	Holmberg, C. J.....	Minneapolis	Lundquist, E. F.....	Minneapolis
Evans, R. D.....	Minneapolis	Holt, W. B.....	Minneapolis	Lynch, M. J.....	Minneapolis
Fahr, G. E.....	Minneapolis	Holzapfel, F. C.....	Minneapolis	Lysne, Henry.....	Minneapolis
Fansler, W. A.....	Minneapolis	Houkom, Bjarne.....	Minneapolis	Lysne, Myron.....	Minneapolis
Feeney, J. M.....	Minneapolis	Hovland, M. L.....	Minneapolis	MacDonald, A. E.....	Minneapolis
Fenger, E. P. K.....	Oak Terrace	Hudson, G. E.....	Minneapolis	MacDonald, D. A.....	Minneapolis
Fetterly, Warren.....	Minneapolis	Huenekens, E. J.....	Minneapolis	Mach, F. B.....	Minneapolis
Fink, L. W.....	Minneapolis	Hultkrans, J. C.....	Minneapolis	MacKinnon, D. C.....	Minneapolis
Fink, W. H.....	Minneapolis	Hultkrans, R. E.....	Minneapolis	Macnie, J. S.....	Minneapolis
Fitzgerald, D. F.....	Minneapolis	Hurd, Anna.....	Minneapolis	Maeder, E. C.....	Minneapolis
Fleijstad, C. A.....	Minneapolis	Hutchinson, C. J.....	Minneapolis	Maland, C. O.....	Minneapolis
Fleming, A. S.....	Minneapolis	Hymes, Charles.....	Minneapolis	Mariette, E. S.....	Oak Terrace
Ford, W. H.....	Minneapolis	Hynes, J. E.....	Minneapolis	Mark, D. B.....	Minneapolis
Foster, W. K.....	Minneapolis	Irvine, H. G.....	Minneapolis	Marking, G. H.....	Osseo
Fowler, L. H.....	Minneapolis	Jackson, C. M.....	Minneapolis	Martinson, C. J.....	Wayzata
Fredericks, G. M.....	Minneapolis	Jennings, Mary H.....	Minneapolis	Matchan, G. R.....	Minneapolis
Friedell, Aaron.....	Minneapolis	Jensen, Harry.....	Minneapolis	Matthews, Justus.....	Minneapolis
Fritzell, K. E.....	Minneapolis	Jensen, M. J.....	Minneapolis	Mattill, P. M.....	Oak Terrace
Frost, J. B.....	Minneapolis	Johnson, A. B.....	Minneapolis	Mattson, Hamlin.....	Minneapolis
Fuller, Alice H.....	Minneapolis	Johnson, A. E.....	Minneapolis	Maxeiner, S. R.....	Minneapolis
Funk, V. K.....	Oak Terrace	Johnson, E. W.....	Minneapolis	May, W. H.....	Minneapolis
Gammell, J. H.....	Minneapolis	Johnson, H. A.....	Minneapolis	McCarthy, Donald.....	Minneapolis
Gardner, E. L.....	Minneapolis	Johnson, J. A.....	Minneapolis	McCartney, J. S.....	Minneapolis
Garten, J. L.....	Minneapolis	Johnson, Julius.....	Minneapolis	McCrimmon, H. P.....	Minneapolis
Giere, E. O.....	Minneapolis	Johnson, N. A.....	Minneapolis	McDaniel, Orianna.....	Minneapolis
Giere, J. C.....	Minneapolis	Johnson, Norman.....	Minneapolis	McFarland, A. H.....	Minneapolis
Giere, R. W.....	Minneapolis	Johnson, N. T.....	Minneapolis	McGandy, R. F.....	Minneapolis
Giessler, P. W.....	Minneapolis	Johnson, R. A.....	Minneapolis	McGeary, G. E.....	Minneapolis
Gilbert, M. G.....	Minneapolis	Johnson, R. E.....	Minneapolis	McInerney, M. W.....	Minneapolis
Gilles, F. L.....	Minneapolis	Johnson, S. M.....	Minneapolis	McIntyre, George.....	Long Beach, Calif.
Gingold, B. A.....	Minneapolis	Johnson, Y. T.....	Minneapolis	McKelvey, J. L.....	Minneapolis
Girvin, R. B.....	Minneapolis	Jones, G. M.....	Minneapolis	McKenzie, C. H.....	Minneapolis
Golberg, M. L.....	Minneapolis	Jones, H. W.....	Minneapolis	McKinlay, C. A.....	Minneapolis
Goldberg, I. M.....	Minneapolis	Jones, H. W., Jr.....	Minneapolis	McKinley, J. C.....	Minneapolis
Goldman, T. I.....	Minneapolis	Jones, W. R.....	Minneapolis	McKinney, F. S.....	Minneapolis
Good, H. D.....	Minneapolis	Josewich, Alexander.....	Minneapolis	McLennan, C. E.....	Minneapolis
Gordon, P. E.....	Minneapolis	Kalin, O. T.....	Minneapolis	McPheeters, H. O.....	Minneapolis
Gratzek, F. R.....	Minneapolis	Karlstrom, A. E.....	Minneapolis	McQuarrie, Irvine.....	Minneapolis
Grave, Floyd.....	Minneapolis	Kelby, G. M.....	Minneapolis	Meland, E. L.....	Minneapolis
Grimes, Marian.....	Minneapolis	Kennedy, C. C.....	Minneapolis	Merkert, C. E.....	Minneapolis
Gronvall, P. R.....	Minneapolis	Kennedy, Jane F.....	Minneapolis	Merkert, G. L.....	Minneapolis
Gunderson, N. A.....	Minneapolis	Kerkhof, A. C.....	Minneapolis	Merrill, Elisabeth.....	Minneapolis
Gushurst, E. G.....	Minneapolis	Kertesz, G.....	Minneapolis	Meyer, E. L.....	Minneapolis
Gustason, H. T.....	Minneapolis	Kibbe, O. A.....	Minneapolis	Michael, J. C.....	Minneapolis
Hacking, F. H.....	Minneapolis	King, E. A.....	Minneapolis	Michel, H. H.....	Minneapolis
Haggard, G. D.....	Minneapolis	King, H. T.....	Minneapolis	Michelson, H. E.....	Minneapolis
Hall, J. M.....	Minneapolis	Kinsella, T. J.....	Minneapolis	Miller, H. E.....	Minneapolis
Halberg, C. A.....	Minneapolis	Kistler, A. J.....	Minneapolis	Miller, J. C.....	Minneapolis
Hallock, Philip.....	Minneapolis	Kistler, C. M.....	Minneapolis	Milton, J. S.....	Minneapolis
Hamel, A. L.....	Minneapolis	Knapp, M. E.....	Minneapolis	Mitchell, E. C.....	Mound
Hamilton, A. S.....	Minneapolis	Knight, R. R.....	Minneapolis	Moe, J. H.....	Minneapolis
Hamlin, G. B.....	Minneapolis	Knight, R. T.....	Minneapolis	Moen, J. K.....	Minneapolis
Hammerstad, L. M.....	Minneapolis	Koepecke, G. M.....	Minneapolis	Moir, W. W.....	Minneapolis
Hammond, A. J.....	Minneapolis	Koller, H. M.....	Minneapolis	Monson, E. M.....	Minneapolis
Hannah, H. B.....	Minneapolis	Koller, L. R.....	Minneapolis	* Moorhead, Martha B.....	Minneapolis
Hansen, C. O.....	Minneapolis	Korchik, J. P.....	Minneapolis	Moren, Edward.....	Minneapolis
Hansen, E. W.....	Minneapolis	Koucky, R. W.....	Minneapolis	Moriarty, Cecile R.....	St. Paul
Hansen, Olga S.....	Minneapolis	Kucera, F. J.....	Hopkins	Morrison, A. W.....	Minneapolis
Hanson, H. J.....	Minneapolis	Kucera, W. J.....	Minneapolis	Morrison, Charlotte J.....	Minneapolis
Hanson, H. V.....	Minneapolis	Lajoie, J. M.....	Minneapolis	Morse, R. W.....	Minneapolis
Hanson, M. B.....	Minneapolis	Lang, L. A.....	Minneapolis	* Morton, H. McI.....	Vincetown, N. J.
Hanson, W. A.....	Minneapolis	Lapierre, A. P.....	Minneapolis	Murphy, E. P.....	Minneapolis
Happe, L. J.....	Minneapolis	* Lapierre, C. A.....	Minneapolis	Murphy, I. J.....	Minneapolis
Harrington, C. D.....	Minneapolis	Lapierre, J. T.....	Minneapolis	Myers, J. A.....	Minneapolis
Harrington, F. E.....	Minneapolis	Larsen, F. W.....	Minneapolis	Neal, J. M.....	Minneapolis
Harris, L. D.....	Minneapolis	Larson, C. M.....	Minneapolis	Neary, R. P.....	Minneapolis
Hart, V. L.....	Minneapolis	Larson, Lawrence M.....	Minneapolis	* Neilson, H. F.....	Minneapolis
Hartzell, T. B.....	Minneapolis	Larson, Leonard M.....	Oak Terrace	Nelson, H. S.....	Minneapolis
Hastings, D. R.....	Minneapolis	Larson, P. N.....	Minneapolis	Nelson, Harvey.....	Minneapolis
Haugen, J. A.....	Minneapolis	La Vake, R. T.....	Minneapolis	Nelson, O. L. N.....	Minneapolis
Haven, W. K.....	Minneapolis	Laymon, C. W.....	Minneapolis	Nelson, W. I.....	Minneapolis
Haverfield, Addie R.....	Minneapolis	Lazar, H. L.....	Minneapolis	Newhart, Horace.....	Minneapolis
Hawkinson, R. P.....	Minneapolis	Leavitt, H. H.....	Minneapolis	Nordin, G. T.....	Minneapolis
Hayes, J. M.....	Minneapolis	Lebowske, J. A.....	Minneapolis	Nordland, Martin.....	Minneapolis
Hayes, A. T.....	Minneapolis	Leclercq, G. T. A.....	Boston, Mass.	Noth, H. W.....	Minneapolis
Head, D. P.....	Minneapolis	Lee, H. M.....	Minneapolis	Nydahl, M. J.....	St. Paul
Head, G. D.....	Minneapolis	Leland, H. R.....	Minneapolis	Nylander, E. G.....	Minneapolis
Heidback, A. E.....	Minneapolis	Leland, J. A. C., Jr.....	Minneapolis	Nystrom, Ruth.....	Minneapolis
Heim, R. R.....	Minneapolis	Lenz, O. A.....	Minneapolis	Oberg, C. M.....	Minneapolis
Hendricks, E. J.....	Minneapolis	Leonard, L. J.....	Minneapolis	O'Brien, W. A.....	Minneapolis
Hendrickson, J. F.....	Minneapolis	Leonard, Sam.....	Minneapolis	O'Donnell, J. E.....	Minneapolis
Henrikson, E. C.....	Minneapolis	Lillehei, E. J.....	Robbinsdale	Olsen, E. G.....	Minneapolis
Henry, C. E.....	Minneapolis	Lind, C. J.....	Minneapolis	Olson, A. C.....	Minneapolis
Henry, M. O.....	Minneapolis	Lindgren, R. C.....	Minneapolis	Olson, F. A.....	Minneapolis
Herbolzheimer, A. J.....	Minneapolis	Lindquist, R. H.....	Minneapolis	Olson, O. A.....	Minneapolis
Herman, A. L.....	Minneapolis	Linner, H. P.....	Minneapolis	Olson, R. G.....	Minneapolis
Hiebert, J. P.....	Minneapolis	Linton, W. B.....	Minneapolis	Oppen, E. G.....	Minneapolis
Higgins, J. H.....	Minneapolis	Lippman, E. S.....	Minneapolis	Owre, Oscar.....	Minneapolis
Hill, Eleanor J.....	Minneapolis	Lipschultz, Oscar.....	Minneapolis	Paine, J. R.....	Minneapolis
Hillis, S. J.....	Minneapolis	Litchfield, J. T.....	Minneapolis	Patterson, W. E.....	Minneapolis
		Litman, A. B.....	Minneapolis	* Paulsen, E. L.....	Minneapolis
		Litzenberg, J. C.....	Minneapolis	Pederson, R. M.....	Minneapolis

*Deceased.

Pennington, Reuben.....	Minneapolis	Schaaf, F. H. K.....	Minneapolis	Sweetser, H. B., Sr.....	Minneapolis
Peppard, T. A.....	Minneapolis	Schaefer, W. G.....	Minneapolis	Sweetser, T. H.....	Minneapolis
Petersen, J. R.....	Minneapolis	Scheldrup, N. H.....	Minneapolis	Sweitzer, S. E.....	Minneapolis
Petersen, Thorvald.....	Minneapolis	Scherer, L. R.....	Minneapolis	Swendseen, C. G.....	Minneapolis
Peterson, Henry.....	Minneapolis	Schiele, B. C.....	Minneapolis	Taylor, J. H.....	Minneapolis
Peterson, H. O.....	Minneapolis	Schmidt, G. F.....	Minneapolis	Thomas, G. E.....	Minneapolis
Peterson, H. W.....	Minneapolis	Schmitt, A. F.....	Minneapolis	Thomas, G. H.....	Minneapolis
Peterson, N. P.....	Minneapolis	Schmitt, S. C.....	Los Angeles, Calif.	Thomas, G. J.....	Minneapolis
Peterson, O. H.....	Minneapolis	Schneider, J. P.....	Minneapolis	Thysell, D. M.....	Minneapolis
Peterson, P. E.....	Minneapolis	Schneidman, N. R.....	Minneapolis	Tingdale, A. C.....	Minneapolis
Peterson, W. C.....	Minneapolis	Schottler, M. E.....	Minneapolis	Trueman, H. S.....	Minneapolis
Petit, L. J.....	Minneapolis	Schultz, P. J.....	Minneapolis	Tunstead, H. J.....	Minneapolis
Peyton, W. T.....	Minneapolis	Schussler, O. F.....	Minneapolis	Turnacliff, D. D.....	Minneapolis
Pfunder, M. C.....	Minneapolis	Schwartz, V. J.....	Minneapolis	Tyrrell, C. C.....	Minneapolis
Phelps, K. A.....	Minneapolis	Schwyzler, Gustav.....	Minneapolis	Ude, W. H.....	Minneapolis
Platou, E. S.....	Minneapolis	Scott, F. H.....	Minneapolis	Ulrich, H. L.....	Minneapolis
Pohl, J. F.....	Minneapolis	Scott, H. G.....	Minneapolis	Undine, C. A.....	Minneapolis
Pollard, D. W.....	Minneapolis	Seashore, Gilbert.....	Minneapolis	Vik, A. E.....	Minneapolis
Pollock, D. K.....	Minneapolis	Seham, Max.....	Minneapolis	Wahlquist, H. F.....	Minneapolis
Polzak, J. A.....	Minneapolis	Seifert, M. H.....	Excelsior	Walch, A. E.....	Minneapolis
Poppe, F. H.....	Minneapolis	Seljeskog, S. R.....	Minneapolis	Waldron, C. W.....	Minneapolis
Pratt, F. J.....	Minneapolis	Selleseth, I. F.....	Minneapolis	Wall, C. R.....	Minneapolis
Pratt, J. A.....	Minneapolis	Sessions, J. C.....	Minneapolis	Wangenstein, O. H.....	Minneapolis
Preine, I. A.....	Minneapolis	Shaperman, Eva P.....	Minneapolis	Wanous, E. Z.....	Minneapolis
Prim, J. A.....	Minneapolis	Shapiro, M. J.....	Minneapolis	Ward, A. W.....	Minneapolis
Proshek, C. E.....	Minneapolis	Sharp, D. V.....	Minneapolis	Ward, P. A.....	Minneapolis
Quello, R. O. B.....	Minneapolis	Siegmann, W. C.....	Minneapolis	Warham, T. T.....	Minneapolis
Quinby, T. F.....	Minneapolis	Silver, J. D.....	Minneapolis	Watson, B. A.....	Minneapolis
Quist, H. W.....	Minneapolis	Simons, J. H.....	Minneapolis	Watson, C. J.....	Minneapolis
Rasmussen, R. C.....	Minneapolis	Simonsen, D. B.....	Minneapolis	*Watson, J. A.....	Minneapolis
Rea, C. E.....	Minneapolis	Simpson, E. D.....	Minneapolis	Webb, R. C.....	Minneapolis
Reed, C. A.....	Minneapolis	Siperstein, D. M.....	Minneapolis	Weisman, S. A.....	Minneapolis
Regnier, E. A.....	Minneapolis	Sivertsen, Andrew.....	Mound	Wethall, A. G.....	Minneapolis
Rewbridge, A. G.....	Minneapolis	Sivertsen, Ivar.....	Minneapolis	Wetherby, Macnider.....	Minneapolis
Reynolds, J. S.....	Minneapolis	Skjold, A. C.....	Minneapolis	Weum, T. W.....	Minneapolis
Rice, C. O.....	Minneapolis	Sloan, Julius.....	Minneapolis	White, A. V.....	Minneapolis
Richardson, F. S.....	Minneapolis	Smisek, F. M.....	Minneapolis	White, S. M.....	Minneapolis
Richdorf, L. F.....	Minneapolis	Smith, A. E.....	Minneapolis	White, W. D.....	Minneapolis
Rieke, W. W.....	Wayzata	Smith, A. M.....	Minneapolis	Whitesell, L. A.....	Minneapolis
Rigler, L. G.....	Minneapolis	Smith, Archie M.....	Minneapolis	Widen, W. E.....	Minneapolis
Risch, R. E.....	Minneapolis	Smith, H. R.....	Minneapolis	Wilcox, A. E.....	Minneapolis
Rishmiller, J. H.....	Minneapolis	Smith, N. M.....	Minneapolis	Wildebush, F. F.....	Minneapolis
Rizer, R. I.....	Minneapolis	Soderlund, R. T.....	Minneapolis	Wilder, K. W.....	Minneapolis
Roan, C. M.....	Minneapolis	Solhaug, S. B.....	Minneapolis	Wilder, R. L.....	Minneapolis
Robb, E. F.....	Minneapolis	Spano, J. P.....	Minneapolis	Wilken, P. A.....	Minneapolis
Robbins, O. F.....	Minneapolis	Sperling, Louis.....	Minneapolis	Willcutt, C. E.....	Minneapolis
Roberts, T. S.....	Minneapolis	Spink, W. M.....	Minneapolis	Williams, Robert.....	Minneapolis
Roberts, W. B.....	Minneapolis	Spratt, C. N.....	Minneapolis	Winer, L. H.....	Minneapolis
Robitshek, E. C.....	Minneapolis	Stanford, C. E.....	Minneapolis	Winther, Nora M. C.....	Minneapolis
Rochford, W. E.....	Minneapolis	Stebbins, T. L.....	Minneapolis	Wipperman, F. F.....	Minneapolis
Rodda, F. C.....	Minneapolis	Stelter, L. A.....	Minneapolis	Witham, C. A.....	Minneapolis
Rosen, Samuel.....	Minneapolis	Stenstrom, Annette T.....	Minneapolis	Wittich, F. W.....	Minneapolis
Rosenwald, R. M.....	Minneapolis	Stewart, C. A.....	Minneapolis	Wohlrahe, A. A.....	Minneapolis
Roskilly, G. C. P.....	Minneapolis	Stewart, R. I.....	Minneapolis	Woodworth, Elizabeth.....	Minneapolis
Ross, A. J.....	Minneapolis	Stoesser, A. V.....	Minneapolis	Wright, C. B.....	Minneapolis
Rucker, W. H.....	Minneapolis	Stomel, Joseph.....	Los Angeles, Calif.	Wright, C. D.....	Minneapolis
Rud, N. E.....	Minneapolis	Strachauer, A. C.....	Minneapolis	Wright, F. R.....	Minneapolis
Rudell, G. L.....	Minneapolis	Stromgren, D. T.....	Minneapolis	Wright, S. G.....	Minneapolis
Ruseth, A. N.....	Minneapolis	*Strout, E. S.....	Minneapolis	Wright, W. S.....	Minneapolis
Rusten, E. M.....	Minneapolis	Strout, G. E.....	Minneapolis	Wynne, H. M. N.....	Minneapolis
Sadler, W. P.....	Minneapolis	Sturte, J. R.....	Minneapolis	Ylvisaker, R. S.....	Minneapolis
St. Cyr, K. J.....	Osseo	Sullivan, R. M.....	Minneapolis	Yoerg, O. W.....	Minneapolis
Salt, C. G.....	Minneapolis	Sullivan, R. R.....	Minneapolis	Zaworski, E. A.....	Minneapolis
Samuelson, Samuel.....	Minneapolis	Sundt, Mathias.....	Minneapolis	Zierold, A. A.....	Minneapolis
Sandt, K. E.....	Minneapolis	Swanson, Cephas.....	Minneapolis	Ziskin, Thomas.....	Minneapolis
Sawatzky, W. A.....	Minneapolis	Swanson, R. E.....	Minneapolis		
		Sweetser, H. B., Jr.....	Minneapolis		

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday of month

Annual meeting, December

Number of Members: 29

President		Danielson, K. A.....	Litchfield	Jensen, H. H.....	Atwater
Petersen, M. C.....	Willmar	Danielson, Lennox.....	Litchfield	Johnson, Hans.....	Kerkhoven
Secretary		Dowswell, W. J.....	Kerkhoven	Lutz, E. H.....	Willmar
Scofield, C. L.....	Benson	Frederickson, Alice C.....	Willmar	Macklin, W. E.....	Litchfield
Anderson, R. E.....	Willmar	Frederickson, G. U. Y.....	Willmar	Petersen, M. C.....	Willmar
Arnson, J. M.....	Benson	Frisch, F. P.....	Willmar	Proeschel, R. K.....	Willmar
Beckjord, P. R.....	Willmar	Frost, E. H.....	Willmar	Ripple, R. J.....	New London
Branton, A. F.....	Willmar	Giere, S. W.....	Benson	Scofield, C. L.....	Benson
Branton, B. J.....	Willmar	Hodapp, R. J.....	Willmar	Telford, V. J.....	Litchfield
Brigham, Frank.....	Watkins	Jacobs, D. L.....	Willmar	Wilmot, C. A.....	Litchfield
Daignault, Oscar.....	Benson	Jacobs, J. C.....	Willmar	Wilmot, H. E.....	Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month

Annual meeting, first Tuesday in October

Number of Members: 20

President		Frank, J. E.....	Marshall	Monson, L. J.....	Canby
Erickson, A. O.....	Ivanhoe	Friedell, George.....	Russell	Purves, G. H.....	Lake Benton
Secretary		Germo, Charles.....	Balaton	Robertson, J. B.....	Minneapolis
Workman, W. G.....	Tracy	Gray, F. D.....	Marshall	Smith, L. A.....	Balaton
Bossingham, O. N.....	Lake Benton	Helferty, J. K.....	Tracy	*Thordarson, Theodore.....	Minneota
Erickson, A. O.....	Ivanhoe	Hermanson, P. E.....	Hendricks	Vadheim, A. L.....	Tyler
Ford, B. C.....	Marshall	Hoidale, A. D.....	Tracy	Valentine, W. H.....	Tracy
		Jacquot, G. L.....	Marshall	Workman, W. G.....	Tracy
		Johnson, P. C.....	Tyler	Yaeger, W. W.....	Marshall

*Deceased

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday of month

Annual meeting, January

Number of Members: 15

President	
Jensen, A. M.	Brownnton
Secretary	
Sheppard, C. G.	Hutchinson
Clement, J. B.	Lester Prairie
Fine, B. A.	Winsted

Goss, H. C.	Glencoe
Jensen, A. H.	Hutchinson
Jensen, A. M.	Brownnton
Langhoff, A. H.	Glencoe
Lippmann, E. W.	Hutchinson
McMahon, M. J.	Green Isle

Sahr, W. G.	Hutchinson
Schmidt, W. R.	Glencoe
Schollp, O. W.	Hutchinson
Sheppard, C. G.	Hutchinson
Sheppard, P. E.	Hutchinson
Tinker, C. W.	Stewart
Trutna, T. J.	Silver Lake

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of month excepting June, July and August

Annual meeting, Tuesday before last Thursday in November

Number of Members: 26

President	
Thomson, J. M.	Brownsdale
Secretary	
Leck, P. C.	Austin
Allen, A. W.	Austin
Allen, C. C.	Austin
Allen, H. B.	Austin
Cronwell, B. J.	Austin
Eckhardt, C. L.	Austin
Flanagan, L. G.	Austin

Grise, W. B.	Austin
*Hanson, E. C.	Austin
Havens, J. G. W.	Austin
Hegge, O. H.	Austin
Hegge, R. S.	Austin
Henslin, A. E.	Le Roy
Hertel, G. E.	Austin
Johnson, O. J.	Lyle
Leck, P. C.	Austin
Lommen, P. A.	Austin

McKenna, J. K.	Austin
Melzer, G. R.	Lyle
Mitchell, R. S.	Grand Meadow
Morrow, J. J.	Austin
Morse, M. P.	Le Roy
Robertson, P. A.	Austin
Schneider, P. J.	Adams
Schottler, G. J.	Dexter
Sheedy, C. L.	Austin
Sher, D. A.	Austin
Thomson, J. M.	Brownsdale

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, April, September, and December

Annual meeting, December

Number of Members: 24

President	
Grimes, B. P.	St. Peter
Secretary	
Strathern, C. S.	St. Peter
Aitkens, H. B.	Le Center
Covell, W. W.	St. Peter
Curtis, R. A.	Le Center
Ericson, Swan	Le Sueur

Freeman, G. H.	St. Peter
Grimes, B. P.	St. Peter
Hiniker, P. J.	Le Sueur
Holtan, Theodore	Waterville
Johnson, H. C.	North Mankato
Kerschbaumer, Luisa	St. Peter
Kolars, J. J.	Le Center
Lenander, M. E.	St. Peter
Miller, E. W.	St. Peter
Nilson, H. J.	North Mankato

Nissen, A. S.	St. Peter
Olmanson, E. G.	St. Peter
Olson, D. C.	Gaylord
Rossen, R. X.	Hastings
Sonnesyn, N. N.	Le Sueur
Strathern, C. S.	St. Peter
Strathern, F. P.	St. Peter
Traxler, F. J.	Henderson
Wohlrahe, C. F.	Nicollet
Wolner, O. H.	St. Peter

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday every odd month

Annual meeting, November

Number of Members: 431

President	
Pemberton, J. deJ.	Rochester
Secretary	
Anderson, M. J.	Rochester
Adams, R. C.	Rochester
Adson, A. W.	Rochester
Ahlfs, Jacob	Caledonia
Allen, E. V.	Rochester
Alvarez, W. C.	Rochester
Barnes, Samuel	Rochester
Anderson, M. J.	Rochester
Anderson, N. E.	Harmony
Arny, F. P.	Preston
Autry, D. H.	Rochester

Braasch, W. F.	Rochester
Broders, A. C.	Rochester
Brown, A. E.	Rochester
Brown, G. E., Jr.	Rochester
Brown, H. A.	Rochester
Brown, H. O.	Rochester
Brown, J. R.	Rochester
Brown, P. W.	Rochester
Browne, H. C., Jr.	Rochester
Brumm, H. J.	Rochester
Brunsting, L. A.	Rochester
Buie, L. A.	Rochester
Burchell, H. B.	Rochester
Butt, H. R.	Rochester
Cabell, C. L.	Rochester
Cameron, D. M.	Rochester
Camp, J. D.	Rochester
Campbell, D. C.	Rochester
Canfield, W. W.	Houston
Chapman, A. S.	Rochester
Chauncey, L. R.	Rochester
Cherry, J. H.	Rochester
Clagett, O. T.	Rochester
Clark, L. W.	Spring Valley
Clegg, R. S.	Rochester
Cleveland, W. H.	Rochester
Clifton, T. A.	Chatfield
Colyer, G. E.	Rochester
Comfort, M. W.	Rochester
Condon, W. B.	Rochester
Conner, H. M.	Rochester
Conway, J. F.	Rochester
Cook, E. N.	Rochester
Counseller, V. S.	Rochester
Coventry, M. B.	Rochester
Cragg, R. W.	Rochester
Craig, W. McK.	Rochester
Crenshaw, J. L.	Rochester
Crewe, J. E.	Rochester
Crumpacker, L. K.	Rochester
Cunningham, B. P.	Rochester
Cusick, P. L.	Rochester
Darling, J. P.	Rochester
Davis, A. C.	Rochester
Davis, I. G.	Rushford
Day, Lois	Rochester

Dearing, W. H.	Rochester
Delmonico, E. J.	Rochester
Derbyshire, R. C.	Rochester
Desjardins, A. U.	Rochester
Dix, C. R.	Rochester
Dixon, C. F.	Rochester
Dockerty, M. B.	Rochester
Doehring, P. C.	Rochester
Dolder, F. C.	Eyota
Donald, C. J., Jr.	Rochester
Dorton, H. E.	Rochester
Doss, A. K.	Rochester
Drake, F. A.	Lanesboro
Drips, Della G.	Rochester
Dry, T. J.	Rochester
Dublin, William	Rochester
Eaton, L. McK.	Rochester
Eginton, C. T.	Rochester
Elkins, E. C.	Rochester
Emmett, J. L.	Rochester
Engle, D. E.	Rochester
English, J. P.	Rochester
Erlich, J. B.	Rochester
Evarts, A. B.	Rochester
Eusterman, G. B.	Rochester
Faber, J. E.	Rochester
*Fawcett, C. E.	Stewartville
Feldman, F. M.	Rochester
Ferris, D. O.	Rochester
Fiel, Charles, Jr.	Rochester
Figi, F. A.	Rochester
Fishback, C. F.	Rochester
Fisher, H. C.	Rochester
Fricke, R. E.	Rochester
Friedall, M. T.	Rochester
Gaarde, F. W.	Rochester
Gardner, J. W.	Rochester
Ghormley, R. K.	Rochester
Giffin, H. M.	Rochester
Giffin, H. Z.	Rochester
Giffin, L. A., Jr.	Rochester
Good, C. A., Jr.	Rochester
Goodson, W. H., Jr.	Rochester
Gore, H. R.	Rochester
Graham, R. W.	Rochester
Grandy, A. Margaret	Rochester

*Deceased

Gray, H. K.	Rochester	Lovelady, S. B.	Rochester	Robinson, F. J.	Rochester
Greene, L. F.	Rochester	Lundy, J. S.	Rochester	Rogne, W. G.	Spring Grove
Gregg, R. O.	Rochester	Luden, Georgine	Victoria, B. C. Can.	Rosenberg, E. F.	Rochester
Grindlay, J. H.	Rochester	Lynch, R. C.	Rochester	Rosenow, E. C.	Rochester
Groff, J. E.	Rochester	MacCarty, W. C.	Rochester	Rosenow, E. C., Jr.	Rochester
Habein, H. C.	Rochester	Macey, H. B.	Rochester	Rosentiel, H. C.	Rochester
Haines, S. F.	Rochester	MacKay, A. R.	Rochester	Rucker, C. W.	Rochester
Haisten, A. S.	Rochester	MacLean, A. R.	Rochester	Rushton, J. G.	Rochester
Hall, B. E.	Rochester	Madding, G. F.	Rochester	Rutledge, D. I.	Rochester
Hallenbeck, D. F.	Rochester	Mader, J. W., Jr.	Rochester	Rynearson, E. H.	Rochester
Hammer, H. J.	Rochester	Magath, T. B.	Rochester	Sanford, A. H.	Rochester
Hargis, W. H., Jr.	Rochester	Maino, C. R.	Rochester	Scheiffley, C. H.	Rochester
Hargraves, M. M.	Rochester	Mann, F. C.	Rochester	Schlicke, C. P.	Rochester
Harpel, R. D.	Rochester	Masson, D. M.	Rochester	Schmidt, H. W.	Rochester
Harper, S. B.	Rochester	Masson, J. C.	Rochester	Schmitt, G. F., Jr.	Rochester
Harrington, S. W.	Rochester	*Mayo, C. H.	Rochester	Schneider, H. H.	Rochester
Harrison, M. W.	Rochester	Mayo, C. W.	Rochester	Schulte, T. L.	Rochester
Hartman, H. R.	Rochester	*Mayo, W. J.	Rochester	Schunke, G. B.	Rochester
Havens, F. Z.	Rochester	Maytum, C. K.	Rochester	Schwartz, E. R.	Stewartville
Hawn, H. W.	Rochester	McCallig, J. J.	Rochester	Schweiger, L. R.	Rochester
Hayden, R. O.	Rochester	McCannel, D. A.	Rochester	Sealy, W. B.	Rochester
Heck, F. J.	Rochester	McCullough, J. A. L.	Rochester	Seedorf, E. E.	Rochester
Heersema, P. H.	Rochester	McDonald, J. R.	Rochester	Seldon, T. H.	Rochester
Heilman, Charles	Rochester	McDonough, F. E.	Rochester	Sharpe, W. S.	Rochester
Heilman, Dorothy M. H.	Rochester	McHeffey, G. J.	Rochester	Shelden, W. D.	Rochester
Heilman, F. R.	Rochester	McKaig, C. B.	Pine Island	Sheldon, C. H.	Rochester
Helland, G. M.	Spring Grove	McKean, R. S.	Rochester	Shepard, V. D.	Rochester
Helland, J. W.	Spring Grove	McKinnon, D. A., Jr.	Rochester	Simonton, K. M.	Rochester
Helmholz, H. F.	Rochester	McLoughlin, C. J.	Rochester	Skaug, H. M.	Chatfield
Hempstead, B. E.	Rochester	McManamy, E. P.	Rochester	Slocumb, C. H.	Rochester
Hench, P. S.	Rochester	Merritt, W. A.	Rochester	Smith, B. F.	Rochester
Henderson, J. W.	Rochester	Meyerding, H. W.	Rochester	Smith, F. D.	Rochester
Henderson, M. S.	Rochester	Miller, J. M.	Rochester	Smith, F. A.	Rochester
Herrell, W. E.	Rochester	Moersch, F. P.	Rochester	Smith, F. L.	Rochester
Hertz, C. S.	Rochester	Moersch, H. J.	Rochester	Smith, H. L.	Rochester
Hewitt, R. M.	Rochester	Montgomery, Hamilton	Rochester	Smith, K. A.	Rochester
Heyerdale, O. C.	Rochester	Morissette, Leopold	Rochester	Smith, L. A.	Rochester
Heyerdale, W. W.	Rochester	Morlock, C. G.	Rochester	Smith, N. D.	Rochester
Hilbrand, Alice G.	Rochester	Mountain, G. E.	Rochester	Smith, R. L., Jr.	Rochester
Hill, J. R.	Rochester	Mousel, L. H.	Rochester	Snell, A. M.	Rochester
Hines, E. A., Jr.	Rochester	Mulrooney, R. E.	Rochester	Snyder, J. M.	Rochester
Hinshaw, H. C.	Rochester	Munn, Elizabeth L.	Rochester	Soniati, T. L. L.	Rochester
Hoffmann, H. O. E.	Rochester	Mussey, R. D.	Rochester	Sprague, R. G.	Rochester
Hollister, C. B. H.	Rochester	Nash, L. A.	Rochester	Squire, E. W.	Rochester
Horton, B. T.	Rochester	Nass, H. A.	Mabel	Stafford, D. E.	Rochester
Howe, R. F.	Rochester	Neel, H. B.	Rochester	Stalker, L. K.	Rochester
Howell, L. P.	Rochester	Nehring, J. P.	Preston	Stickney, J. M.	Rochester
Hummer, G. J.	Rochester	Nesbitt, Samuel	Rochester	Stuhler, L. G.	Rochester
Hunt, A. B.	Rochester	New, G. B.	Rochester	Sutherland, C. G.	Rochester
Jackman, R. J.	Rochester	Nickel, W. R.	Rochester	Swartz, F. C.	Rochester
Jenovese, J. F.	Rochester	Norris, N. T.	Caledonia	Swingle, H. F., Jr.	Rochester
Jensen, R. M.	Rochester	O'Brien, J. P.	Rochester	Tenner, R. J.	Rochester
Johnson, H. P.	Harmony	Odel, H. M.	Rochester	Tennison, William, III.	Rochester
Johnson, R. B.	Lanesboro	Olds, J. W.	Rochester	Thigpen, F. M.	Rochester
Joyce, G. L.	Rochester	O'Leary, P. A.	Rochester	Thompson, G. J.	Rochester
Judd, E. S.	Rochester	Olsen, A. M.	Rochester	Tierney, C. M.	Harmony
Jump, W. C.	Kasson	Olson, E. A.	Pine Island	Tischer, E. P.	Rochester
Kapernick, J. S.	Rochester	Olson, G. E.	West Concord	Tillisch, J. H.	Rochester
Kearney, R. W.	Rochester	Ongard, L. K.	Houston	Tooke, T. B., Jr.	Rochester
Keating, F. R., Jr.	Rochester	Pansch, F. N.	Rochester	Trandem, C. Elinor	Rochester
Keith, H. M.	Rochester	Parker, R. L.	Rochester	Tuohy, E. B.	Rochester
Keith, N. M.	Rochester	Parkhill, Edith M.	Rochester	Twyman, R. A.	Rochester
Kennedy, R. L. J.	Rochester	Pastore, P. N.	Rochester	Uihlein, Alfred	Rochester
Kepler, E. J.	Rochester	Pattison, D. H.	Rochester	Usher, F. C.	Rochester
Kernohan, J. W.	Rochester	Pattson, G. D.	Pittsburgh, Pa.	Vadheim, J. L.	Rochester
Kershner, C. M.	Rochester	Paulson, D. L.	Rochester	Vaughn, L. D.	Rochester
Kibler, J. M.	Rochester	Paulson, J. A.	Rochester	Vickers, P. M.	Rochester
Kierland, R. R.	Rochester	Pearman, R. O. D.	Rochester	Wagener, H. P.	Rochester
Killins, J. A.	Rochester	Pemberton, J. deJ.	Rochester	Waggoner, R. P.	Rochester
Kimmel, J. C., Jr.	Rochester	Pennington, R. E.	Rochester	Waisman, Morris	Rochester
Kindschi, Leslie	Rochester	Perozzi, Thelma	Santa Barbara, Calif.	Wakefield, E. G.	Rochester
King, H. E.	Rochester	Peters, G. A.	Rochester	Walsh, J. J.	Rochester
King, W. L. M.	Rochester	Peterson, W. G.	Rochester	Walsh, M. N.	Rochester
Kirklin, B. R.	Rochester	Phalen, G. S.	Rochester	Walters, Waltman	Rochester
Kirklin, O. L.	Rochester	Phillips, R. B.	Rochester	Watkins, C. H.	Rochester
Koelsche, G. A.	Rochester	Piper, M. C.	Rochester	Waugh, J. M.	Rochester
Kowallis, G. F.	Rochester	Plimpton, N. C., Jr.	Rochester	Weber, H. M.	Rochester
Krusen, F. H.	Rochester	Plummer, W. A.	Rochester	Weir, J. F.	Rochester
Kvale, W. F.	Rochester	Pollock, G. A.	Rochester	Weismann, R. E.	Rochester
Kyser, F. A.	Rochester	Pollock, L. W.	Rochester	Westrup, J. E.	Rochester
Lander, H. H.	Rochester	Pool, T. L.	Rochester	Wiig, L. M.	Naperville, Ill.
Lannin, J. C.	Mabel	Popp, W. C.	Rochester	Wilcox, L. E.	Rochester
Leary, W. V.	Rochester	Powers, F. H.	Rochester	Wilder, R. M.	Rochester
Leddy, E. T.	Rochester	Prangen, A. D.	Rochester	Williams, H. L.	Rochester
Leffel, J. M., Jr.	Rochester	Prickman, L. E.	Rochester	Williams, R. V.	Rushford
Lemon, W. S.	Rochester	Priestley, J. T.	Rochester	Willius, F. A.	Rochester
Lewis, E. B.	Rochester	Prunty, F. C.	Rochester	Willson, D. M.	Rochester
Lien, R. J.	Rochester	Pugh, D. G.	Rochester	Wilson, L. B.	Rochester
Lillie, H. I.	Rochester	Quill, T. H.	Rochester	Wilson, R. B.	Rochester
Little, A. G.	Rochester	Ralph, R. D.	Rochester	Wilson, W. H.	Rochester
Little, E. H.	Rochester	Randall, K. C., II	Rochester	Wollaeger, E. E.	Rochester
Lipscomb, P. R.	Rochester	Randall, L. M.	Rochester	Woltman, H. W.	Rochester
Lloyd, S. J.	Rochester	Rasmussen, T. B.	Montreal, Can.	Wood, B. J.	Rochester
Lochhead, D. C.	Rochester	Rasmussen, W. C.	Rochester	Wood, H. G.	Rochester
Lockwood, W. W.	Fort Peck, Mont.	Raszkowski, H. J.	Rochester	Woodruff, C. W.	Chatfield
Logan, A. H.	Rochester	Redding, M. D.	Rochester	Woodruff, Robert	Rochester
Logan, G. B.	Rochester	Reeser, R. J.	Rochester	Woods, R. M.	Rochester
Love, J. G.	Rochester	Rein, G. N.	Rochester	Wozencraft, J. P.	Rochester
Love, W. R.	Rochester	Richardson, R. I.	Rushford	Wrook, D. H.	Rochester
Lovelace, W. R.	Rochester	Richardson, W. E.	Rushford	Wulf, R. F.	Rochester
		Risser, A. F.	Stewartville	Yeager, C. L.	Rochester
		Rivers, A. B.	Rochester	Young, H. H.	Rochester
		Robertson, H. E.	Rochester		

*Deceased.

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties

Regular meetings, Second Wednesday every other month

Annual meeting, December

Number of Members: 60

President	
Lund, C. J. T.	Underwood
Secretary	
Boline, C. A.	Battle Lake
Arndt, H. W.	Detroit Lakes
Baker, A. C.	Fergus Falls
Baker, N. H.	Fergus Falls
Bergquist, K. E.	Battle Lake
Blakey, A. R.	Osakis
Boline, C. A.	Battle Lake
Boyd, L. M.	Alexandria
Boysen, J. E.	Pelican Rapids
Boysen, Peter	Pelican Rapids
Broker, W. S.	Wadena
Burnap, W. L.	Fergus Falls
Clifford, G. W.	Alexandria
Combacker, L. C.	Fergus Falls
Drought, W. W.	Fergus Falls
Esser, John	Perham
Estrem, C. O.	Fergus Falls
Fisher, J. M.	Fergus Falls
Freeman, W. N.	Perham

Griswold, F. E.	Hoffman
*Hand, W. R.	Elbow Lake
Hanson, E. C.	New York Mills
Haskell, A. D.	Alexandria
Heiberg, E. A.	Fergus Falls
Jacobs, G. C.	Fergus Falls
Johnson, O. V.	Fergus Falls
Kierland, P. E.	Alexandria
Lee, W. A.	Fergus Falls
Leibold, H. H.	Parkers Prairie
Leighton, Robert	Evansville
Leland, J. T.	Herman
Lewis, A. J.	Henning
Love, F. A.	Carlos
Lund, C. J. T.	Underwood
McLane, W. O.	Perham
McMahon, L. H.	Breckenridge
Miller, W. A.	New York Mills
Mouritsen, G. J.	Fergus Falls
Naegeli, Frank	Fergus Falls
Nelson, W. O. B.	Fergus Falls

Otto, H. C.	Frazee
Parson, L. R.	Elbow Lake
Parson, Lillian B.	Elbow Lake
Patterson, W. L.	Fergus Falls
Paulson, T. S.	Fergus Falls
Paulson, E. C.	Dalton
Randall, A. M.	Ashby
Reeve, E. T.	Elbow Lake
Rimer, E. W.	Breckenridge
Satersmoen, Theodore	Pelican Rapids
Sather, E. R.	Alexandria
Schamber, W. F.	Parkers Prairie
Schleinitz, F. B.	Battle Lake
Serkland, J. C.	Rothsay
Stemsrud, H. L.	Parkers Prairie
Sutton, H. R.	Hoffman
Tanquist, E. J.	Alexandria
Vail, J. B.	Henning
Warner, J. J.	Perham
Wasson, L. F.	Alexandria
Webster, L. J.	Battle Lake
Wray, W. E.	Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday in every month excepting June, July, August

Annual meeting, last Monday in January

Number of Members: 339

President	
Ruhberg, G. N.	St. Paul
Secretary	
Wilson, J. A.	St. Paul
Abbott, J. S.	St. Paul
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Alberts, M. W.	St. Paul
Alden, J. F.	St. Paul
Alexander, F. H.	St. Paul
Armstrong, J. M.	St. Paul
Arnquist, A. S.	St. Paul
Aurelius, J. R.	St. Paul
Ausman, C. E.	St. Paul
Bacon, D. K.	St. Paul
Bacon, L. C.	St. Paul
Balcome, M. M.	St. Paul
Barry, L. W.	St. Paul
Barsness, Nellie O. N.	St. Paul
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beech, R. H.	St. Paul
Beek, H. O.	St. Paul
Bell, C. C.	St. Paul
Benepe, J. L.	St. Paul
Bennion, P. H.	St. Paul
Bentley, N. P.	St. Paul
Berrisford, P. D.	St. Paul
Bicek, J. F.	St. Paul
Binger, H. E.	St. Paul
Birnberg, T. L.	St. Paul
Bock, R. A.	St. Paul
Boeckmann, Egil	St. Paul
*Bohland, E. H.	St. Paul
Bolender, H. L.	St. Paul
Borg, J. F.	St. Paul
Bouma, L. R.	St. Paul
Brand, G. D.	St. Paul
Bray, E. R.	St. Paul
Briggs, J. F.	St. Paul
Broadie, T. E.	St. Paul
Brodie, W. D.	St. Paul
Brown, E. I.	St. Paul
Brown, J. C.	St. Paul
Bulinski, T. J.	St. Paul
Burch, E. P.	St. Paul
Burch, F. E.	St. Paul
Burns, R. M.	St. Paul
Burton, C. G.	St. Paul
Busher, H. H.	St. Paul
Cain, C. L.	St. Paul
Caldwell, J. P.	St. Paul
Carroll, W. C.	St. Paul
Chatterton, C. C.	St. Paul
Christiansen, A.	St. Paul
Christison, J. T.	St. Paul
Clark, H. B., Jr.	St. Paul
Clark, T. C.	Minneapolis
Cochrane, B. B.	St. Paul
Colby, W. L.	St. Paul
Cole, W. H.	St. Paul
Collie, H. G.	St. Paul

Colvin, A. R.	St. Paul
Connor, C. E.	St. Paul
Cook, C. K.	St. Paul
Cooper, C. C.	St. Paul
Countrymen, R. S.	St. Paul
Cowern, E. W.	North St. Paul
Critchfield, L. R.	St. Paul
Culligan, J. M.	St. Paul
Dack, L. G.	St. Paul
Daugherty, E. B.	Marine-on-St. Croix
Daugherty, L. E.	St. Paul
Davis, Herbert	St. Paul
Davis, William	St. Paul
DeCoursey, D. M.	St. Paul
Dedolph, Karl	St. Paul
Delavan, P. A.	St. Paul
Derauf, B. I.	St. Paul
Dickson, T. H.	St. Paul
Dittman, G. C.	St. Paul
Donohue, P. F.	St. Paul
Dovre, C. M.	St. Paul
Drake, C. B.	St. Paul
Dunn, J. N.	St. Paul
Earl, George	St. Paul
Earl, John	St. Paul
Earl, Robert	St. Paul
Edlund, G.	St. Paul
Edwards, J. W.	St. Paul
Edwards, T. J.	St. Paul
Ely, O. S.	South St. Paul
Emerson, E. C.	St. Paul
Endress, E. K.	St. Paul
Ernest, G. C. H.	South St. Paul
Eshelby, E. C.	St. Paul
Fahey, E. W.	St. Paul
Ferguson, J. C.	St. Paul
Fesler, H. H.	St. Paul
Flanagan, H. F.	St. Paul
Fogarty, C. W.	St. Paul
Fogelberg, E. J.	St. Paul
Foley, F. E. B.	St. Paul
Freeman, C. D.	St. Paul
Freidman, L. L.	St. Paul
Fritz, W. L.	St. Paul
Froats, C. W.	St. Paul
Gager, E. C.	St. Paul
Garbrecht, Arthur	St. Paul
Gardiner, D. G.	St. Paul
Geer, E. K.	St. Paul
Gehlen, J. N.	St. Paul
Geist, G. A.	St. Paul
Ghent, C. H.	St. Paul
Gibbs, E. C.	St. Paul
Gillfillan, J. S.	St. Paul
Gilkey, S. E.	St. Paul
Ginsberg, Wm.	St. Paul
Goltz, E. V.	St. Paul
Grant, H. W.	St. Paul
Gratzek, Thomas	St. Paul
Grau, R. K.	St. Paul
Gruenhagen, A. P.	St. Paul
Hagaman, G. K.	St. Paul
Hall, A. R.	St. Paul
Hall, H. H.	St. Paul
Hammes, E. M.	St. Paul

Hammond, J. F.	St. Paul
Hanson, H. B.	St. Paul
Harmon, G. E.	St. Paul
Hartfiel, W. F.	St. Paul
Hartley, E. C.	St. Paul
Hassett, M. F.	St. Paul
Hauser, V. P.	St. Paul
Hawkins, V. J.	St. Paul
Heath, A. C.	Stillwater
Heck, W. W.	St. Paul
Hedenstrom, F. G.	St. Paul
Hengstler, W. H.	St. Paul
Hensel, C. N.	St. Paul
Herman, Samuel	St. Paul
Heron, R. C.	St. Paul
Herrmann, E. T.	St. Paul
Hilger, A. W.	St. Paul
Hilger, D. D.	St. Paul
Hilger, L. A.	St. Paul
Hilleboe, H. E.	St. Paul
Hiniker, L. P.	St. Paul
Hochfizer, J. J.	St. Paul
Hoff, Alfred	St. Paul
Hoffman, M. H.	St. Paul
Holcomb, J. T.	St. Paul
Holcomb, O. W.	St. Paul
Holmen, R. W.	St. Paul
Holt, J. E.	St. Paul
Hopkins, G. W.	St. Paul
Howard, M. A.	St. Paul
Howard, W. S.	St. Paul
Hullsiek, R. B.	St. Paul
Ide, A. W.	St. Paul
Ikeda, Kano	St. Paul
Ingerson, C. A.	St. Paul
Jesion, J. W.	St. Paul
Johanson, W. G.	St. Paul
Johnson, A. M.	St. Paul
Johnson, C. E.	St. Paul
Johnson, J. A.	St. Paul
Johnson, T. H.	San Francisco, Calif.
Jones, E. M.	St. Paul
Kamman, G. R.	St. Paul
Kannary, E. L.	St. Paul
Kaplan, D. H.	St. Paul
Kasper, E. M.	St. Paul
Keele, Rolland	St. Paul
Kelly, J. V.	St. Paul
Kelly, P. H.	St. Paul
Keneffick, E. V.	St. Paul
Kennedy, W. A.	St. Paul
Kenyon, T. J.	St. Paul
Kesting, Herman	St. Paul
King, G. L.	St. Paul
Klein, H. N.	St. Paul
Knauff, M. K.	St. Paul
Koepsell, A. A. H.	St. Paul
Kugler, A. A.	St. Paul
Kvitrud, Gilbert	St. Paul
Langenderfer, F. V.	St. Paul
Larsen, C. L.	St. Paul
Lax, M. H.	St. Paul
Leahy, Bartholomew	St. Paul
Leavenworth, R. O.	St. Paul
Leick, R. M.	St. Paul

*Deceased.

Leitch, Archibald.....	St. Paul	Olson, C. A.....	St. Paul	Sohlberg, O. I.....	St. Paul
Lepak, J. A.....	St. Paul	O'Reilly, B. E.....	St. Paul	Souster, B. B.....	St. Paul
Lerche, William.....	Cable, Wis.	Ostergren, E. W.....	St. Paul	Sprafka, J. M.....	St. Paul
Leven, N. L.....	St. Paul	Ouellette, A. J.....	St. Paul	Steinberg, C. L.....	St. Paul
Levin, Bert.....	St. Paul	Page, C. V.....	St. Paul	Sterner, E. G.....	St. Paul
Levitt, G. X.....	St. Paul	Pearson, F. R.....	St. Paul	Sterner, E. R.....	St. Paul
Lick, C. L.....	St. Paul	Perry, C. G.....	St. Paul	Steube, R. W.....	St. Paul
Lippman, H. S.....	St. Paul	Peterson, D. B.....	St. Paul	Stewart, Alexander.....	St. Paul
Little, W. J.....	St. Paul	Peterson, J. L. E.....	St. Paul	Stinnette, S. E.....	St. Paul
Lowe, E. R.....	South St. Paul	Peterson, V. N.....	St. Paul	Stoeckmann, A. E.....	St. Paul
Lowe, T. A.....	South St. Paul	Plondke, F. J.....	St. Paul	Stolpestad, A. H.....	St. Paul
Lundholm, A. M.....	South St. Paul	Prendergast, H. J.....	St. Paul	Stolpestad, H. L.....	St. Paul
Lynch, F. W.....	St. Paul	Prendergast, J. J.....	St. Paul	Strate, G. E.....	St. Paul
Madden, J. F.....	St. Paul	Radabaugh, R. C.....	Hastings	Strauss, M. L.....	St. Paul
Markoe, J. C.....	St. Paul	Ramsey, W. R.....	St. Paul	Swanson, J. A.....	St. Paul
Marks, R. W.....	St. Paul	Richards, E. T. F.....	St. Paul	Swendson, J. J.....	St. Paul
Martineau, J. L.....	St. Paul	Richardson, H. E.....	St. Paul	Teisberg, C. B.....	St. Paul
Mattson, C. H.....	St. Paul	Rick, P. F. W.....	St. Paul	Thompson, F. A.....	St. Paul
Maun, M. E.....	St. Paul	Ritchie, H. P.....	St. Paul	Thoreson, M. O.....	South St. Paul
McCann, E. J.....	St. Paul	Ritchie, W. P.....	St. Paul	Tift, C. R.....	St. Paul
McCarthy, J. J.....	St. Paul	Ritt, A. E.....	St. Paul	Tregilgas, H. R.....	South St. Paul
McCarthy, W. R.....	St. Paul	Rogers, S. F.....	St. Paul	Van Slyke, C. A.....	St. Paul
McClanahan, J. H.....	White Bear	Rosenblatt, Louis.....	St. Paul	Veirs, Dean.....	St. Paul
McClanahan, T. S.....	White Bear	Rosenholtz, Burton.....	St. Paul	Veirs, Ruby S.....	St. Paul
McLaren, Jennette M.....	Minneapolis	Rosenthal, Robert.....	St. Paul	Venables, A. E.....	St. Paul
McNevin, C. F.....	St. Paul	Rothrock, J. L.....	St. Paul	Von der Weyer, William.....	St. Paul
Meade, J. R.....	St. Paul	Rothschild, H. J.....	St. Paul	Waas, C. W.....	St. Paul
Mears, B. J.....	St. Paul	Roy, P. C.....	St. Paul	Walker, A. E.....	St. Paul
Medelman, J. P.....	St. Paul	Ruhberg, G. N.....	St. Paul	Walter, C. W.....	St. Paul
Meyerding, E. A.....	St. Paul	Rutherford, W. C.....	St. Paul	Warnock, R. W.....	St. Paul
Moga, J. A.....	St. Paul	Ryan, J. J.....	St. Paul	Warren, C. A.....	St. Paul
Molander, H. A.....	St. Paul	Ryan, J. M.....	St. Paul	Warren, E. L.....	St. Paul
Moquin, Marie A.....	St. Paul	Ryan, M. E.....	St. Paul	Watz, C. E.....	St. Paul
Moriarty, Berence.....	St. Paul	Sarnecki, M. M.....	St. Paul	Webber, F. L.....	St. Paul
Morrissey, F. B.....	St. Paul	Satterlund, V. L.....	St. Paul	Weisberg, Maurice.....	St. Paul
Moss, M. N.....	St. Paul	Savage, F. J.....	St. Paul	Welch, M. C.....	St. Paul
*Moynihan, T. J.....	St. Paul	Schoch, R. B. J.....	St. Paul	Wenzel, G. P.....	St. Paul
Muller, R. T.....	St. Paul	Schons, Edward.....	St. Paul	Werner, O. S.....	Cambridge
Myers, Thomas.....	St. Paul	Schuldt, F. C.....	St. Paul	Wheeler, M. W.....	St. Paul
Naegeli, A. E.....	St. Paul	Schulze, A. G.....	St. Paul	Whitacre, J. C.....	St. Paul
Naslund, A. W.....	St. Paul	Schwyzner, Arnold.....	St. Paul	Whitmore, F. W.....	St. Paul
*Neher, F. H.....	St. Paul	Scott, E. E.....	St. Paul	Williams, A. B.....	St. Paul
Nelson, K. L.....	Minneapolis	Senkler, G. E.....	St. Paul	Williams, C. K.....	St. Paul
Nelson, L. A.....	St. Paul	Setzer, H. J.....	St. Paul	Williamson, G. A.....	St. Paul
Nichols, A. E.....	St. Paul	Shellman, J. L.....	St. Paul	Wilson, J. A.....	St. Paul
Noble, J. F.....	St. Paul	Shillington, M. A.....	Glendive, Mont.	Wilson, J. V.....	St. Paul
Noble, J. L.....	St. Paul	Shimonek, S. W.....	St. Paul	Winnick, J. B.....	St. Paul
Nuebel, C. J.....	St. Paul	Short, Jacob.....	St. Paul	Wold, K. C.....	St. Paul
Nye, Katherine A.....	St. Paul	Simons, L. T.....	St. Paul	Wolfe, H. H.....	St. Paul
Nye, Lillian L.....	St. Paul	Singer, B. J.....	St. Paul	Wolff, H. J.....	St. Paul
O'Brien, W. M.....	St. Paul	Skinner, H. O.....	St. Paul	Wolkoff, H. J.....	St. Paul
O'Connor, L. J.....	St. Paul	Smisek, E. A.....	St. Paul	Youngren, E. R.....	St. Paul
Oerting, Harry.....	St. Paul	Smith, V. D. E.....	St. Paul	Zachman, L. L.....	St. Paul
Ogden, Warner.....	St. Paul	Snyder, G. W.....	St. Paul	Zander, C. H.....	St. Paul
Ohage, Justus, Jr.....	St. Paul			Zimmermann, H. B.....	St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk; Red Lake and Roseau Counties

Regular meetings, second Tuesday every quarter

Annual meeting, second Tuesday, December

Number of Members: 61

President		Delmore, J. L., Sr.....	Roseau
Shedlov, Abraham.....		Ederer, J. J.....	Mahnomen
Secretary		Erickson, Eskil.....	Halstad
Oppegaard, C. L.....		Furst, J. N.....	Hallock
Adkins, C. M.....		Griffin, P. J.....	Fertile
Anderson, W. E.....		Haugseth, Enoch.....	Twin Valley
Anderson, W. S.....		Hedemark, H. H.....	Thief River Falls
Behr, O. K.....		Helseth, H. K.....	Thief River Falls
Berge, D. O.....		Henney, W. H.....	McIntosh
Berlin, A. S.....		Hodgson, H. H.....	Crookston
Bertelson, O. L.....		Hollands, W. H.....	Fisher
Biedermann, Jacob.....		Holmstrom, C. H.....	Warren
Blegen, H. M.....		Johnson, H. C.....	Thief River Falls
Boardman, D. V.....		Kirk, G. P.....	East Grand Forks
Bohl, G. W.....		Knutson, G. A.....	Greenbush
Borreson, Baldwin.....		Kostick, W. R.....	Fertile
Bratrud, Edward.....		Leitch, N. M.....	Warroad
Brink, A. A.....		Loken, Theodore.....	Ada
Brown, L. L.....		Lynde, O. G.....	Thief River Falls
Delmore, J. L., Jr.....		Melby, O. F.....	Thief River Falls
		Mercil, W. F.....	Crookston
		Morley, G. A.....	Crookston
		Nelson, H. E.....	Crookston
		Norman, J. F.....	Crookston
		Ohnstad, J. L.....	McIntosh
		Oppegaard, C. L.....	Crookston
		Oppegaard, M. O.....	Crookston
		Paradis, W. G.....	Crookston
		Parsons, J. G.....	Crookston
		Pellettiere, E. V.....	Thief River Falls
		Reff, A. R.....	Crookston
		Robertson, F. O.....	East Grand Forks
		Roy, J. A.....	Red Lake Falls
		Sather, Allen.....	Fosston
		Sather, G. O.....	Fosston
		Sather, R. O.....	Crookston
		Shalean, A. W.....	Hallock
		Shedlov, Abraham.....	Fosston
		Stevens, John.....	Gonvick
		Stocking, F. F.....	Hallock
		Stuurmanns, S. H.....	Erskine
		Tanglin, W. G. L.....	Mahnomen
		Torgerson, W. B.....	Oklee
		Uhley, C. G.....	Crookston
		Weed, V. A.....	Red Lake Falls

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, February, May, August, and November

Annual meeting, May

Number of Members: 31

President		Abbott, C. B.....	Springfield
Fritsche, C. J.....		Anderson, E. M.....	Lamberton
Secretary		Benton, P. C.....	Gibbon
Saffert, Cornelius A.....		Brey, F. W.....	Wabasso
		Cairns, R. J.....	Sanborn
		Dubbe, F. H.....	New Ulm
		Dysterheft, A. F.....	Gaylord
		Esser, O. J.....	Gibbon
		Fesenmaier, O. B.....	New Ulm
		Fritsche, Albert.....	New Ulm
		Fritsche, C. J.....	New Ulm
		Fritsche, T. R.....	New Ulm
		Gibbons, F. C.....	Comfrey
		Goblirsch, A. P.....	Sleepy Eye

*Deceased.

Hammermeister, T. F.....New Ulm
Hovde, Rolf.....Winthrop
Just, H. J.....Lafayette
Kusske, A. L.....New Ulm
Mortensbak, H. E.....Hanska
Nuessle, W. G.....Springfield

Pelant, F. J.....New Ulm
Peterson, R. A.....Vesta
Reineke, G. F.....New Ulm
*Rothenburg, J. C.....Springfield
Saffert, C. A.....New Ulm
Schroeppel, J. E.....Winthrop

Seifert, O. J.....New Ulm
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Wahlberg, E. W.....Sleepy Eye
Weiser, G. B.....New Ulm
Wohlrahe, E. J.....Springfield

RENNVILLE COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of each month

Annual meeting, November

Number of Members: 22

President
Flinn, T. E.....Redwood Falls

Secretary
Billings, R. E.....Franklin
Adams, R. C.....Bird Island
Billings, R. E.....Franklin
Brand, W. A.....Redwood Falls
Bushard, W. J.....Bird Island

Cephecha, S. F.....Redwood Falls
Cole, H. B.....Redwood Falls
Cole, J. G.....Redwood Falls
Cosgriff, J. A.....Olivia
Dordal, J. E.....Sacred Heart
Erickson, R. E.....Hector
Fawcett, A. M.....Renville
Flinn, T. E.....Redwood Falls
Gaines, E. C.....Buffalo Lake

Hartmann, C. M.....Fairfax
Johnson, O. H.....Redwood Falls
Johnson, W. E.....Morgan
Lenz, J. R.....Morton
Mesker, G. H.....Olivia
Passer, A. A.....Olivia
Penhall, F. W.....Morton
Potthoff, C. J.....Minneapolis
Preisinger, J. W.....Renville

RICE COUNTY MEDICAL SOCIETY

Regular meetings, at call

Annual meeting, December

Number of Members: 34

President
Plonske, C. J.....Faribault

Secretary
Lende, Norman.....Faribault
Babcock, F. M.....Northfield
Beede, Ethel R.....Faribault
Dugan, L. F.....Faribault
Dungay, N. S.....Northfield
Engberg, E. J.....Faribault
Francis, D. W.....Morristown
Haessly, S. B.....Faribault
Hanson, A. M.....Faribault

Huxley, F. R.....Faribault
Kanne, C. W.....Faribault
Lende, Norman.....Faribault
Lexa, F. J.....Lonsdale
Lyght, C. E.....Northfield
McKeon, J. O.....Montgomery
Meyer, F. C.....Kenyon
Meyer, P. F.....Faribault
Moses, Joseph, Jr.....Northfield
Moyer, R. E.....Faribault
Nuetzman, A. W.....Faribault
Plonske, C. J.....Faribault
Robilliard, C. M.....Faribault

Rohrer, C. A.....Waterville
Rumpf, C. W.....Faribault
Rumpf, W. H.....Faribault
Seeley, I. F.....Northfield
Stroebe, C. F.....Northfield
Thorson, O. P.....Northfield
Traeger, C. A.....Faribault
Warren, F. S.....Washington, D. C.
Weaver, P. H.....Faribault
West, E. J.....Faribault
Wilkowske, R. J.....Owatonna
Wilson, Warren.....Northfield
Wylie, A. R. T.....Faribault

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties

Regular meetings, second Thursday every month except July and August

Annual meeting, December

Number of Members: 234

President
Chapman, T. L.....Duluth

Secretary
MacRae, G. C.....Duluth
Abraham, A. L.....Duluth
Adams, B. S.....Hibbing
Addy, E. R.....Gilbert
Ahl, C. W.....Hibbing
Akins, W. M.....Eveleth
Anderson, H. R.....Deer River
Arko, J. L.....Hibbing
Armstrong, E. L.....Duluth
Athens, A. G.....Duluth
Ayres, G. T.....Ely
Bachnik, F. W.....Hibbing
Bagley, C. M.....Duluth
Bagley, Elizabeth C.....Duluth
Bagley, W. R.....Duluth
Bakkila, Henry.....Duluth
Bardon, Richard.....Duluth
Barney, L. A.....Duluth
Barrett, E. E.....Duluth
Becker, F. T.....Duluth
Bender, J. H.....Big Fork
Berdez, G. L.....Duluth
Bianco, A. J.....Duluth
Binet, H. E.....Grand Rapids
*Birkland, O. N.....Hibbing
Blacklock, S. S.....Hibbing
Blakely, C. C.....Barnum
Boman, P. G.....Duluth
Bowen, R. L.....Hibbing
Boyer, S. H., Jr.....Duluth
Boyer, S. H., Sr.....Duluth
Braverman, N. J.....Duluth
Bray, P. N.....Duluth
Bray, R. B.....Biwabik
Buckley, R. P.....Duluth
Burton, J. L.....Buhl
Butler, J. K.....Carlton
Castwell, W. F.....International Falls
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
Cheney, E. L.....Duluth

Chermak, F. G.....International Falls
Christensen, E. P.....Two Harbors
Clark, F. F.....Duluth
Clement, T. G.....Duluth
Collins, A. N.....Duluth
Collins, H. C.....Duluth
Coventry, W. A.....Duluth
Coventry, W. D.....Duluth
Dahlin, I. T.....Aurora
Davies, R. J.....Nopeming
Doolittle, L. E.....Duluth
Doyle, G. C.....Duluth
Eckman, P. F.....Duluth
Eckman, R. J.....Duluth
Ekblad, J. W.....Duluth
Elias, F. J.....Duluth
Elliott, W. S.....Virginia
Emanuel, K. W.....Duluth
Eppard, R. M.....Cloquet
Erskine, G. M.....Grand Rapids
Estrem, T. A.....Hibbing
Ewens, H. B.....Virginia
Fankboner, A. V.....Buhl
Fawcett, K. R.....Duluth
Fellows, M. F.....Duluth
Feuling, J. C.....Bovey
Fischer, M. McC.....Duluth
Fisketti, Henry.....Duluth
Forbes, R. S.....Duluth
Gendron, J. F.....Grand Rapids
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Giroux, A. A.....Moose Lake
Goldish, D. R.....Duluth
Goodman, C. E.....Virginia
Gowan, L. R.....Duluth
Graham, Robert.....Duluth
Graves, W. N.....Duluth
Hall, A. E.....Virginia
Haney, C. L.....Duluth
Hanson, E. O.....Cloquet
Harlowe, H. D.....Virginia
Harris, C. N.....Hibbing
Hatch, W. E.....Duluth
Hathaway, S. J.....Proctor
Hayes, M. F.....Nashwauk
Hedberg, G. A.....Nopeming

Heiam, W. C.....Cook
*Heimark, O. E.....Duluth
Hilding, A. C.....Duluth
Hill, F. E.....Duluth
Hirschboeck, F. J.....Duluth
Hirschfeld, M. S.....Duluth
Hoff, H. O.....Duluth
Hurst, M. M.....Hibbing
Hutchinson, Henry.....Moose Lake
Jacobson, Clarence.....Chisholm
Jensen, T. J.....Duluth
Johnson, K. E.....Duluth
Jolin, F. M.....Coleraine
Jolin, R. V.....Grand Rapids
Kemp, M. W.....Moose Lake
Kiesling, I. H.....Nashwauk
Klein, A. D.....Chisholm
Klein, Harry.....Duluth
Knapp, F. N.....Duluth
Kohlbray, C. O.....Duluth
Kotchevar, F. R.....Eveleth
Kozberg, Oscar.....Moose Lake
Kraft, Peter.....Duluth
Kuth, J. R.....Duluth
La Bree, R. H.....Chisholm
Laird, A. T.....Nopeming
Langmack, William.....Cloquet
Lenont, C. B.....Virginia
Lepak, F. J.....Duluth
Litman, S. N.....Duluth
Loofbourrow, E. H.....Keewatin
Macfarlane, P. H.....Chisholm
MacRae, G. C.....Duluth
Magney, F. H.....Duluth
Malmstrom, J. A.....Virginia
Manley, J. R.....Duluth
Marcle, W. J.....Nopeming
Martin, E. T.....Duluth
Martin, W. C.....Duluth
Mayne, R. M.....Duluth
McCarty, P. D.....Ely
McComb, C. F.....Duluth
McCoy, Mary K.....Duluth
McDaniel, S. P.....Virginia
McDonald, A. L.....Duluth
McHaffie, O. L.....Duluth

*Deceased.

McKenna, M. J.....Grand Rapids
 McLeod, J. L.....Grand Rapids
 McNutt, J. R.....Duluth
 Mead, C. H.....Duluth
 Merriman, L. L.....Duluth
 Meyer, J. O.....Grand Rapids
 Miners, G. A.....Deer River
 Moe, R. J.....Duluth
 Moe, Thomas.....Moose Lake
 Mollers, T. P.....Mountain Iron
 Monroe, P. B.....Two Harbors
 Monserud, N. O.....Cloquet
 More, C. W.....Eveleth
 Morsman, L. W.....Hibbing
 Mueller, R. F.....Two Harbors
 Mueller, Selma C.....Duluth
 Neff, W. S.....Virginia
 Nelson, E. H.....Chisholm
 Nelson, R. L.....Duluth
 Nicholson, M. A.....Duluth
 Nutting, R. E.....Duluth
 O'Hanlon, J. A.....Proctor
 Olson, A. E.....Duluth
 Olson, A. O.....Duluth
 Palmer, H. A.....Black Duck
 Parker, O. W.....Ely
 Parker, W. H.....Chisholm
 Parson, E. I.....Askov
 Pasek, A. W.....Cloquet
 Pearsall, R. P.....Virginia
 Pedersen, R. C.....Duluth
 Pennie, D. F.....Duluth
 Peterson, E. N.....Virginia
 Peterson, J. H.....Duluth

Pfuetze, K. W.....Nopeming
 Plowman, E. T.....Marble
 Power, J. E.....Duluth
 Puumala, R. H.....Cloquet
 Raadquist, C. S.....Hibbing
 Rahala, John.....Virginia
 Raiter, F. W. S.....Cloquet
 Raiter, R. F.....Cloquet
 Robinson, J. M.....Duluth
 Rokala, H. E.....Biwabik
 Rood, D. C.....Duluth
 Rosenfield, A. B.....Hibbing
 Rowe, O. W.....Duluth
 Rowles, E. K.....Coleraine
 Rudie, P. S.....Duluth
 Ryan, W. J.....Duluth
 Sach-Rowitz, Alvan.....Moose Lake
 Salter, R. A.....Virginia
 Sarff, O. E.....Virginia
 Sax, S. G.....Duluth
 Scherer, C. A.....Duluth
 Schroder, C. H.....Duluth
 Schweiger, T. R.....Hibbing
 Seashore, R. T.....Duluth
 Shapiro, E. Z.....Duluth
 Shastid, T. H.....Duluth
 Shaw, A. W.....Virginia
 Siegel, J. S.....Virginia
 Sinamark, Andrew.....Hibbing
 Sisler, C. E.....Grand Rapids
 Slyfield, F. E.....Duluth
 Smith, C. M.....Duluth
 Smith, S. J.....Eveleth
 Smith, W. R.....Grand Marais
 Snyder, O. E.....Ely

Spang, A. J.....Duluth
 Spicer, F. W.....Duluth
 Spurbeck, R. G.....Cloquet
 Strathern, M. L.....Gilbert
 Stewart, D. E.....Grand Rapids
 Strobel, W. G.....Duluth
 Stuart, A. B.....Cloquet
 Sukeforth, L. A.....Duluth
 Sutherland, H. N.....Ely
 Swanson, P. E.....Virginia
 Swedberg, W. A.....Duluth
 Swenson, A. O.....Duluth
 Taylor, C. W.....Duluth
 Terrell, B. J.....Nopeming
 Tibbetts, M. H.....Duluth
 Tilderquist, D. L.....Duluth
 Tingdale, A. C.....Hibbing
 Trytten, E. G.....Coleraine
 Tuohy, E. L.....Duluth
 Urberg, S. E.....Duluth
 Van Valkenberg, J. D.....Floodwood
 Vercellini, C. E.....Duluth
 Walker, A. E.....Duluth
 Wallace, M. O.....Duluth
 Watson, C. G.....Soudan
 Webber, E. E.....Duluth
 Wellman, T. G.....Virginia
 Wells, A. H.....Duluth
 Welton, P. C.....Nopeming
 Wheeler, D. W.....Duluth
 Winter, J. A.....Duluth
 Young, T. O.....Duluth
 Young, V. A.....Duluth
 Zlatovski, M. L.....Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of the month

Annual meeting, June

Number of Members: 34

President

Havel, H. W.....Jordan

Secretary

Pearson, B. F.....Shakopee

Bodaski, A. A.....Montgomery
 Buck, F. H.....Shakopee
 Cervenka, C. F.....New Prague
 Crow, E. R.....Arlington
 Eklund, E. J.....Norwood
 Emmerson, W. S.....Mayer
 *Fischer, H. P.....Shakopee
 Garthe, J. J.....Shakopee

Havel, H. W.....Jordan
 Hebeisen, M. B.....Chaska
 Henriksen, H. G.....Northfield
 Juergens, H. M.....Belle Plaine
 Klein, J. C.....Shakopee
 Kortsch, F. P.....Prior Lake
 Kucera, S. T.....Lonsdale
 Kurtin, H. J.....Lonsdale
 Malerich, J. A.....Shakopee
 Martin, T. P.....Arlington
 Nagel, H. D.....Waconia
 Novak, E. E.....New Prague
 Olson, C. J.....Belle Plaine

Ormond, D. T.....Waconia
 Pearson, B. F.....Shakopee
 Phillips, W. H.....Jordan
 Pogue, R. E.....Watertown
 Reiter, H. W.....Shakopee
 Schimelpfenig, G. T.....Chaska
 Shrader, J. S.....Marietta
 Simons, B. H.....Chaska
 Westerman, A. E.....Montgomery
 Westerman, F. C.....Montgomery
 Wiechman, F. H.....Montgomery
 Woodworth, L. F.....Le Center
 Wunder, H. E.....Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties

Regular meetings, November and April

Annual meeting, October or November

Number of Members: 65

President

Stevenson, B. M.....Fulda

Secretary

DeBoer, Hermanus.....Edgerton

Arnold, E. W.....Adrian
 Balmer, A. I.....Pipestone
 Basinger, H. P.....Windom
 Basinger, H. R.....Mountain Lake
 Beckering, Gerrit.....Edgerton
 Benjamin, W. G.....Pipestone
 Bofenkamp, F. W.....Luverne
 Bong, J. H.....Jasper
 Brown, A. H.....Pipestone
 Carlson, J. V.....Westbrook
 Chadbourn, A. G.....Heron Lake
 Chunn, S. S.....Pipestone
 Clark, H. H.....Minneapolis
 Cress, P. J.....Ellsworth
 DeBoer, Hermanus.....Edgerton
 Doman, V. W.....Lakefield
 Doms, H. C. A.....Slayton
 Dudley, J. H.....Windom

Engh, Sigfred.....Jackson
 Halloran, W. H.....Jackson
 Halpern, D. J.....Brewster
 Harrison, P. W.....Worthington
 Hebbel, Robert.....Windom
 Hitchings, W. S.....Lakefield
 Hoyer, L. J.....Windom
 Johnson, R. E.....Worthington
 Johnston, L. F.....Slayton
 Kilbride, E. A.....Worthington
 Kilbride, J. S.....Worthington
 Larson, J. T.....Lake Wilson
 Lohmann, J. G.....Jasper
 Maitland, D. P.....Jackson
 Maitland, E. T.....Jackson
 *McCrea, J. M.....Fulda
 McElmeel, E. F.....Pipestone
 McLane, Evelyn A.....Jackson
 Mork, B. O., Jr.....Worthington
 Mork, B. O., Sr.....Worthington
 Nealy, D. E.....Adrian
 Pankratz, P. J.....Mountain Lake
 Piper, W. A.....Mountain Lake
 Rogers, C. W.....Heron Lake

Rose, J. T.....Lakefield
 Schade, F. L.....Worthington
 Schutz, E. S.....Mountain Lake
 Schmidt, W. R.....Worthington
 Sether, A. F.....Ruthlon
 Settlage, A. F. E.....Worthington
 Sherman, C. L.....Luverne
 Sjostrom, L. E.....Storden
 Slater, S. A.....Worthington
 Smith, G. G.....Fulda
 Sogge, L. J.....Windom
 Sorum, F. T.....Jasper
 Stanley, C. R.....Worthington
 Stevenson, B. M.....Fulda
 Stratte, H. C.....Windom
 Thorson, E. O.....Luverne
 Toft, Josephine.....Minneapolis
 Waller, J. D.....Wilmont
 Wells, W. B.....Jackson
 Williams, C. A.....Pipestone
 Williams, J. A.....Slayton
 Williams, L. A.....Slayton
 Wilson, I. H.....Worthington
 Wright, C. O.....Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of the month

Annual meeting, third Thursday of December

Number of Members: 50

President

Donaldson, C. S.....Foley

Secretary

Libert, J. N.....St. Cloud

*Deceased.

Baumgartner, F. H.....Albany
 Beuning, J. B.....St. Cloud
 Brigham, C. F.....St. Cloud
 Buscher, J. C.....St. Cloud
 Clark, H. B.....St. Cloud
 Donaldson, C. S.....Foley

DuBois, J. F.....Sauk Center
 Engstrom, G. F.....Belgrade
 Evans, L. M.....Sauk Rapids
 Fleming, T. N.....St. Cloud

Freeman, W. L.....St. Cloud
 Friesleben, William.....Sauk Rapids
 Gaida, J. B.....St. Cloud
 Goehrs, H. W.....St. Cloud
 Haberman, Emil.....Osakis
 Halenback, P. L.....St. Cloud
 Hemstead, Werner.....Brainerd
 Henry, C. J.....Milaca
 Holdridge, George.....Foley
 Johnson, Walfred.....Sauk Center
 Jones, R. N.....St. Cloud
 Kern, M. J.....St. Cloud
 Kettlewell, R. B.....Sauk Center

Kingsbury, E. M.....Clearwater
 Kohler, D. W.....St. Joseph
 Koop, S. H.....Richmond
 Kuhlmann, August.....Melrose
 Lewis, C. B.....St. Cloud
 Libert, J. N.....St. Cloud
 Mahowald, A.....Albany
 McDowell, J. P.....St. Cloud
 Meyer, A. J.....Melrose
 Moos, D. J.....St. Cloud
 Musachio, N. F.....Milaca
 Myre, C. R.....Paynesville
 Raetz, S. J.....Maple Lake
 Rathbun, C. A.....St. Cloud

Richards, W. B.....St. Cloud
 Rumpf, W. H.....St. Cloud
 Sandven, N. O.....Paynesville
 Schatz, F. J.....St. Cloud
 Sherwood, G. E.....Kimball
 *Stangl, Fred.....St. Cloud
 Stangl, P. E.....St. Cloud
 Steward, N. E.....St. Cloud
 Sutton, C. S.....St. Cloud
 Townsend, De Wayne.....Brooklyn
 Walfred, K. A.....St. Cloud
 Watson, W. J.....Holdingford
 Wenner, W. T.....St. Cloud
 Zachman, A. H.....Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, March, June, September, December

Annual meeting, January

Number of Members: 16

President
 Roberts, O. W.....Owatonna
 Secretary
 McIntyre, J. A.....Owatonna
 Berghs, L. V.....Owatonna
 Carlson, V. W.....Blooming Prairie

Dewey, D. H.....Owatonna
 Ertel, E. Q.....Ellendale
 Hartung, E. H.....Claremont
 Kreuzer, T. C.....Owatonna
 McEnaney, C. T.....Owatonna
 McIntyre, J. A.....Owatonna
 Melby, Benedik.....Blooming Prairie

Morehead, D. E.....Owatonna
 Nelson, E. J.....Owatonna
 Roberts, O. W.....Owatonna
 Schaefer, J. F.....Owatonna
 Senn, E. W.....Owatonna
 Stewart, A. B.....Owatonna
 Stransky, T. W.....Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard
 Koochiching, Lake of the Woods, Morrison, Todd and Wadena Counties

Regular meetings, every third month

Annual meeting, January

Number of Members: 88

President
 Nelson, N. P.....Brainerd
 Secretary
 Badeaux, G. I.....Brainerd
 Adkins, G. H.....Pine River
 Amundson, A. E.....Little Falls
 Badeaux, G. I.....Brainerd
 Beise, R. A.....Brainerd
 Borgerson, A. H.....Sebek
 Bosland, H. G.....Verndale
 Bray, K. E.....Park Rapids
 Cardle, G. E.....Brainerd
 Carlson, C. E.....Aitkin
 Christie, G. R.....Long Prairie
 Cook, J. M.....Staples
 Coombs, C. H.....Cass Lake
 Corrigan, J. E.....Waycross, Ga.
 Davis, L. F.....Wadena
 Davis, L. T.....Wadena
 Davis, R. D.....Clearbrook
 Davis, T. C.....Wadena
 East, John.....Northome
 Eiler, John.....Park Rapids
 Ericson, M. G.....Long Prairie
 Eyres, T. E.....Pequot
 Fait, R. V.....Little Falls
 Fitzsimons, W. E.....Brainerd
 Frost, H. T.....Wadena
 Garlock, A. V.....Bemidji
 Garlock, D. H.....Bemidji
 Gerber, M. P.....Brainerd

Ghostley, Mary C.....Puposky
 Gifford, B. L.....Long Prairie
 Gilmore, Rowland.....Bemidji
 Grogan, J. S.....Wadena
 Groschupf, T. P.....Bemidji
 Grose, F. N.....Clarissa
 Halliday, G. J.....Brainerd
 Haller, William.....Bemidji
 Hanover, R. D.....Littlefork
 Hawkinson, J. P.....Crosby
 Hiebert, H. L.....Ah-Gwah-Ching
 Higgs, W. W.....Park Rapids
 Holst, C. F.....Little Falls
 Holst, J. B.....Little Falls
 House, Z. E.....Cass Lake
 Houston, D. M.....Park Rapids
 Hubbard, O. E.....Brainerd
 Hubin, E. G.....Deerwood
 Jacobson, D. J.....Bemidji
 Jamieson, E. F.....Brainerd
 Johnson, C. E.....Pine River
 Johnson, D. L.....Little Falls
 Johnson, E. W.....Bemidji
 *Kelly, B. W.....Aitkin
 Kerlan, Irvin.....Washington, D. C.
 Knights, J. A.....Bemidji
 Lamb, H. L.....Little Falls
 Larson, L. J.....Bagley
 Lee, H. W.....Brainerd
 Leemhuis, G. H.....McGregor
 Lenarz, A. J.....Browerville

Marcum, E. H.....Bemidji
 McCann, D. F.....Bemidji
 Mithy, I. L.....Aitkin
 Mosby, M. E.....Long Prairie
 Mulligan, A. M.....Brainerd
 Murray, R. A.....Aitkin
 Nelson, N. P.....Brainerd
 O'Leary, J. H.....Staples
 Petraborg, H. T.....Aitkin
 Pierce, C. H.....Wadena
 Potek, David.....International Falls
 Quanstrom, V. E.....Brainerd
 Ratcliffe, J. J.....Aitkin
 Ringle, O. F.....Walker
 Roberts, L. M.....Little Falls
 Simons, E. J.....Swanville
 Simons, S. J.....Akeley
 Smith, B. A.....Crosby
 Stafford, C. E.....Hewitt
 Stein, R. J.....Pierz
 Swedenburg, P. A.....Swanville
 Thabes, J. A., Jr.....Brainerd
 Thabes, J. A., Sr.....Brainerd
 Vandersluis, C. W.....Bemidji
 Watson, A. M.....Royalton
 Watson, P. T.....Cass Lake
 Whittmore, D. D.....Bemidji
 Will, C. B.....Bertha
 Will, W. W.....Bertha
 Wilson, V. O.....Minneapolis
 Wingquist, C. G.....Crosby
 Withrow, M. E.....International Falls

WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, March, October

Annual meeting, first Thursday after first Monday in October

Number of Members: 14

President
 Ellis, E. W.....Elgin
 Secretary
 Wilson, W. F.....Lake City
 Bayley, E. C.....Lake City

Bouquet, B. J.....Wabasha
 Cochrane, W. J.....Lake City
 Collins, J. S.....Wabasha
 Ellis, E. W.....Elgin
 Flesche, B. A.....Lake City
 Glabe, R. A.....Plainview

Hendrickson, R. R.....Wabasha
 Holt, G. W.....Wabasha
 Mahle, D. G.....Plainview
 Ochsner, C. G.....Wabasha
 Roplogle, W. H.....Wabasha
 Slocumb, J. A.....Plainview
 Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Regular meetings, none

Annual meeting, December

Number of Members: 9

President
 Hottinger, R. C.....Janesville
 Secretary
 Olds, G. H.....Waseca

Bernstein, W. C.....New Richland
 Gallagher, B. J.....Waseca
 Hottinger, R. C.....Janesville
 McIntire, H. M.....Waseca

Oeljen, S. C. G.....Waseca
 Olds, G. H.....Waseca
 Spittler, R. O.....New Richland
 Swenson, O. J.....Waseca
 Wadd, C. T.....Waseca

*Deceased.

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, February, March, April, May, September, October
November and December
Annual meeting second Tuesday in December
Number of Members: 18

President	Gray, R. C.....Minneapolis	Mingo, F. E.....Hugo
Kalinoff, D. ....Stillwater	Haines, J. H.....Stillwater	Poirier, J. A.....Forest Lake
Secretary	Humphrey, W. R.....Stillwater	Ruggles, G. McC.....Forest Lake
Boleyn, E. S.....Stillwater	Johnson, R. G.....Stillwater	Samson, E. R.....Stillwater
	Josewski, R. J.....Stillwater	Sherman, C. H.....Bayport
Boleyn, E. S.....Stillwater	Kalinoff, D.....Stillwater	Strand E. V.....Bayport
Brooks, G. F.....Stillwater	McCarten, F. M.....Stillwater	Street, Bernard .....St. Cloud
		Stuhr, J. W.....Stillwater
		Wilkinson, Stella L.....Newport

WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, at call
Annual meeting, December
Number of Members: 8

President	Bergman, O. B.....St. James	Hagen, O. E.....Butterfield
Bregel, F. L.....St. James	Bratrude, E. J.....St. James	Hammar, L. M.....Butterfield
Secretary	Bregel, F. L.....St. James	McCarthy, W. J.....Madelia
Grimes, H. B.....Madelia	Grimes, H. B.....Madelia	Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties

Regular meetings, second Wednesday, March, May, October, December
Annual meeting October
Number of Members: 28

President	Dahle, M. B.....Glenwood	Lindberg, A. L.....Wheaton
Elsely, E. M.....Glenwood	Doleman, N. F.....Tintah	Linde, Herman.....Cyrus
Secretary	Eberlin, E. A.....Glenwood	Magnuson, A. E.....Graceville
Linde, Herman.....Cyrus	Elsely, E. McC.....Glenwood	Merrill, Robert .....Morris
	Elsely, J. R.....Glenwood	McIver, B. A.....Lowry
Arneson, A. I.....Morris	Engdahl, F. W.....Ortonville	Mooney, L. P.....Graceville
Bates, B. V.....Browns Valley	Ewing, C. F.....Wheaton	Muir, W. F.....Graceville
Behmler, F. W.....Morris	Fitzgerald, E. T.....Morris	O'Donnell, D. M.....Ortonville
Bergan, Otto.....Clinton	Garrow, D. M.....St. Paul	Oliver, C. L.....Graceville
Bolsta, Charles.....Ortonville	Giesen, A. F.....Starbuck	Oliver, I. L.....Graceville
Caine, C. E.....Morris	Karn, B. R.....Ortonville	Ransom, M. L.....Hancock
*Cumming, J. F.....Morris		

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July, October
Annual meeting, first Monday in January
Number of Members: 30

President	Lindsay, W. V.....Winona	Roth, F. D.....Lewiston
Heise, W. V.....Winona	Loomis, G. L.....Winona	Satterlee, H. W.....Lewiston
Secretary	Mattison, P. A.....Winona	Schaefer, Samuel.....Winona
Tweedy, J. A.....Winona	McLaughlin, E. M.....Winona	Steiner, I. W.....Winona
	Meinert, A. E.....Winona	
Benoit, F. T.....Winona	Nauth, W. W.....Winona	Tweedy, G. J.....Winona
Christensen, E. E.....Winona	Neumann, C. A.....Winona	Tweedy, J. A.....Winona
Hamlon, J. S.....St. Charles	*Nilles, L. J.....Rollingstone	Tweedy, R. B.....Winona
Heise, Herbert.....Winona	Page, R. L.....St. Charles	Walker, G. H.....Winona
Heise, W. F. C.....Winona	Risser, E. D.....Winona	Whetstone, S. D.....Winona
Heise, W. V.....Winona	Robbins, C. P.....Winona	Wilson, R. H.....Winona
Jacobs, L. G.....Winona	Roemer, H. J.....Winona	Younger, L. I.....Winona
Keyes, J. D.....Winona		

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, first Tuesday in October
Number of Members: 18

President	Catlin, T. J.....Buffalo	Phillips, A. E.....Delano
Thielen, R. D.....St. Michael	Ellison, F. E.....Monticello	Ridgway, A. M.....Annandale
Secretary	Greenfield, W. T.....Delano	Roholt, C. L.....Waverly
Catlin, J. J.....Buffalo	Grundset, O. J.....Montrose	Rolig, D. H.....Howard Lake
Anderson, W. P.....Buffalo	Hansen, Rorbye .....Monticello	*Rousseau, Victor.....Maple Lake
Bendix, L. H.....Annandale	Harriman, L.....Howard Lake	
Catlin, J. J.....Buffalo	Hart, W. E.....Monticello	Thielen, R. D.....St. Michael
	Lee, J. L.....Watertown	Thompson, Arthur.....Cokato
	Peterson, O. L.....Cokato	

*Deceased

ALPHABETIC ROSTER

Aagaard, G. N., Jr. Minneapolis
Aanes, A. M. Red Wing
Aanes, A. R. Ellsworth, Wis.
Abbott, C. B. Springfield
Abbott, J. S. St. Paul
Aborn, W. H. Hawley
Abraham, A. L. Duluth
Abramson, Milton. Minneapolis
Adams, B. S. Hibbing
Adams, J. M. Minneapolis
Adams, R. C. Bird Island
Adams, R. C. Rochester
Addy, E. R. Gilbert
Adkins, C. M. Thief River Falls
Adson, A. W. Rochester
Ahl, C. W. Hibbing
Ahls, J. J. Caledonia
Ahrens, A. E. St. Paul
Ahrens, A. H. St. Paul
Aitkens, H. B. Le Center
Alkins, W. M. Eveleth
Alberts, M. W. St. Paul
Alden, J. F. St. Paul
Alexander, F. H. St. Paul
Alexander, H. A. Minneapolis
Aling, C. A. Minneapolis
Aling, C. P. Minneapolis
Allen, A. W. Austin
Allen, C. C. Austin
Allen, E. V. N. Rochester
Allen, H. W. Minneapolis
Allen, H. B. Austin
Allison, R. G. Minneapolis
Altnow, H. O. Minneapolis
Alvarez, W. C. Rochester
Amberg, Samuel. Rochester
Amundson, A. E. Little Falls
Andersen, A. G. Minneapolis
Andersen, S. C. Minneapolis
Anderson, D. D. Minneapolis
Anderson, E. D. Minneapolis
Anderson, E. M. Lambert
Anderson, E. R. Minneapolis
Anderson, F. J. Minneapolis
Anderson, H. R. Deer River
Anderson, J. K. Minneapolis
Anderson, K. W. Minneapolis
Anderson, M. J. Rochester
Anderson, N. E. Harmony
Anderson, P. A. Minneapolis
Anderson, R. E. Willmar
Anderson, S. H. Red Wing
Anderson, U. S. Minneapolis
Anderson, W. E. Thief River Falls
Anderson, W. P. Buffalo
Anderson, W. S. Minneapolis
Andreassen, E. C. Minneapolis
Andrews, R. N. Mankato
Andrews, R. S. Minneapolis
Annis, H. B. Minneapolis
Arends, A. L. Sandstone
Arey, S. L. Excelsior
Arko, J. L. Hibbing
Arlander, C. E. Minneapolis
Arling, L. S. Minneapolis
Armstrong, E. L. Duluth
Armstrong, J. M. St. Paul
Arndt, H. W. Detroit Lakes
Arneson, A. I. Morris
Arnold, Anna W. Minneapolis
Arnold, D. C. Minneapolis
Arnold, E. W. Adrian
Arnquist, A. S. St. Paul
Arnson, J. M. Benson
Army, F. P. Preston
Arvidson, C. G. Minneapolis
Athens, A. G. Duluth
Aune, Martin. Minneapolis
Aurand, W. H. Minneapolis
Aurelius, J. R. St. Paul
Ausman, C. F. St. Paul
Autry, D. H. Rochester
Ayles, G. T. Ely

Bagley, W. R. Duluth
Bagwell, J. S., Jr. Rochester
Bailey, A. A. Rochester
Bailey, H. B. Fairmont
Bair, H. L. Rochester
Baken, M. P. Minneapolis
Baker, A. B. Minneapolis
Baker, A. C. Fergus Falls
Baker, A. T. Minneapolis
Baker, E. L. Minneapolis
Baker, G. S. Rochester
Baker, H. R. Hayfield
Baker, Looe. Minneapolis
Baker, N. H. Fergus Falls
Baker, R. L. Hayfield
Baker, Theodore, Jr. Rochester
Bakkila, H. E. Duluth
Balcome, M. M. St. Paul
Balfour, D. C. Rochester
Balkin, S. G. Minneapolis
Balmer, A. I. Pipestone
Barber, J. P. Minneapolis
Bardon, Richard. Duluth
Bargen, J. A. Rochester
Barker, N. W. Rochester
Barnes, A. R. Rochester
Barney, L. A. Duluth
Barr, L. C. Albert Lea
Barr, W. H. Wells
Barrett, E. E. Duluth
Barrett, R. H. Rochester
Barron, Moses. Minneapolis
Barry, L. W. St. Paul
Barsness, Nellie O. N. St. Paul
Basinger, H. P. Windom
Basinger, H. R. Mountain Lake
Basom, W. C. Rochester
Bass, G. W. Minneapolis
Bates, B. V. Browns Valley
Baumgartner, F. H. Albany
Baxter, S. H. Minneapolis
Bayard, H. F. Minneapolis
Bayley, E. C. Lake City
Beadie, W. D. Cannon Falls
Beals, Hugh. St. Paul
Beard, A. H. Minneapolis
Becker, F. T. Duluth
Beckering, Gerrit. Edgerton
Beckjord, P. R. Willmar
Beckman, W. G. Minneapolis
Bedford, E. W. Minneapolis
Beech, R. H. St. Paul
Beede, Ethel R. Faribault
Beek, H. O. St. Paul
Behmler, F. W. Morris
Behr, O. K. Crookston
Beise, R. A. Brainerd
Beizer, L. H. Rochester
Bell, C. C. St. Paul
Bell, E. T. Minneapolis
Belote, G. B. Caledonia
Belzer, M. S. Minneapolis
Bender, J. H. Big Fork
Bendix, L. H. Annandale
Benedict, W. L. Rochester
Benepe, J. L. St. Paul
Benesh, N. G. Minneapolis
Benham, E. W. Mankato
Benjamin, A. E. Minneapolis
Benjamin, E. G. Minneapolis
Benjamin, H. G. Minneapolis
Benjamin, W. G. Pipestone
Benn, F. G. Minneapolis
Bennett, R. L., Jr. Rochester
Bennion, P. H. St. Paul
Benoit, F. T. Winona
Bentley, N. P. St. Paul
Benton, P. C. Gibbon
Berdez, G. L. Duluth
Bergan, Otto. Clinton
Berge, D. O. Roseau
Bergen, C. T. Blue Earth
Berger, A. G. Minneapolis
Bergh, G. S. Minneapolis
Bergh, L. N. Montevideo
Berghs, L. V. Owatonna
Bergman, O. B. St. James
Bergquist, K. E. Battle Lake
Berkman, D. M. Rochester
Berkman, J. M. Rochester
Berkwitz, N. J. Minneapolis
Berlin, A. S. Hallock
Berman, Reuben. Minneapolis
Bernstein, W. C. New Richland
Berrisford, P. D. St. Paul
Bertelson, O. L. Crookston

Bessesen, A. N., Jr. Minneapolis
Bessesen, D. H. Minneapolis
Bessesen, W. A. Minneapolis
Beuning, J. B. St. Cloud
Bianco, A. J. Duluth
Bicek, J. F. St. Paul
Bickel, W. H. Rochester
Biedermann, Jacob. Thief River Falls
Bigelow, C. E. Dodge Center
Billings, R. E. Franklin
Binet, H. E. Grand Rapids
Binger, H. E. St. Paul
Binger, M. W. Rochester
Birge, R. F. Rochester
*Birkland, O. N. Hibbing
Birnberg, T. L. St. Paul
Black, B. M. Rochester
Black, J. R. Rochester
Black, William. Mankato
Blacklock, S. S. Hibbing
Blake, James. Hopkins
Blake, James A. Hopkins
Blakely, C. C. Barnum
Blakey, A. R. Osakis
Blanchard, H. G. Fairmont
Blaustone, H. H. Minneapolis
Blegen, H. M. Warren
Blomberg, W. R. Princeton
Blumenthal, J. S. Minneapolis
Blumstein, Alex. Minneapolis
Boardman, D. V. Twin Valley
Bock, R. A. St. Paul
Bockman, M. W. H. Minneapolis
Bodaski, A. A. Montgomery
Boeckmann, Egil. St. Paul
Boehme, E. J. Minneapolis
Boehr, J. J. Minneapolis
Bofenkamp, F. W. Luverne
Bohl, G. W. Ada
*Bohland, E. H. St. Paul
Boles, L. R. Minneapolis
Bolender, H. L. St. Paul
Boleyn, E. S. Stillwater
Boline, C. A. Battle Lake
Bolsta, Charles. Ortonville
Boman, P. G. Duluth
Bong, J. H. Jasper
Boody, G. J., Jr. Dawson
Booth, A. E. Minneapolis
Boothby, W. M. Rochester
Boreen, C. A. Minneapolis
Borg, J. F. St. Paul
Borgerson, A. H. Sebeka
Borgeson, E. J. Minneapolis
Borman, C. N. Minneapolis
Borreson, Baldwin. Thief River Falls
Bosland, H. G. Verndale
Bossert, C. S. Mora
Bossingham, O. N. Lake Benton
Bottolfson, B. T. Moorhead
Bouma, L. R. St. Paul
Bouman, H. A. H. Minneapolis
Bouquet, B. J. Wabasha
Bowen, R. L. Hibbing
Bowling, H. H. Rochester
Boyd, L. M. Alexander
Boyer, S. H. Duluth
Boyer, S. H., Jr. Duluth
Boynton, Ruth E. Minneapolis
Boysen, Herbert. Welcome
Boysen, J. E. Pelican Rapids
Boysen, Peter. Pelican Rapids
Braasch, W. F. Rochester
Brand, G. D. St. Paul
Brand, W. A. Redwood Falls
Branton, A. F. Willmar
Branton, B. J. Willmar
Bratrud, A. F. Minneapolis
Bratrud, Edward. Thief River Falls
Bratrude, E. J. St. James
Braverman, N. J. Duluth
Bray, E. R. St. Paul
Bray, K. E. Park Rapids
Bray, P. N. Duluth
Bray, R. B. Biwabik
Bregel, F. L. St. James
Brekke, H. J. Minneapolis
Brey, F. W. Wabasso
Briggs, J. F. St. Paul
Brigham, C. F. St. Cloud
Brigham, F. T. Watkins
Brink, A. A. Baudette
Brink, D. M. Isle
Broadie, T. E. St. Paul
Broders, A. C. Rochester
Brodie, W. D. St. Paul

*Deceased

Broker, W. S. Wadena
 Brooks, C. N. Minneapolis
 Brooks, G. F. Stillwater
 Brown, A. E. Rochester
 Brown, A. H. Pipestone
 Brown, E. D. Paynesville
 Brown, E. I. St. Paul
 Brown, G. E., Jr. Rochester
 Brown, H. A. Rochester
 Brown, H. O. Rochester
 Brown, J. C. St. Paul
 Brown, J. R. Rochester
 Brown, L. L. Crookston
 Brown, P. W. Rochester
 Browne, H. C., Jr. Rochester
 Brownstone, Manuel. Sandstone
 Brumm, H. J. Rochester
 Brunning, L. A. Rochester
 Brusegard, J. C. Red Wing
 Brusch, G. F. Minneapolis
 Bryant, F. L. Minneapolis
 Buchstein, H. F. Minneapolis
 Ruck, F. H. Shakopee
 Buckley, R. P. Duluth
 Buie, L. A. Rochester
 Bulinski, T. J. St. Paul
 Bulkley, Kenneth. Minneapolis
 Bunker, B. W. Anoka
 Burch, E. P. St. Paul
 Burch, F. E. St. Paul
 Burchell, H. B. Rochester
 Burnap, W. L. Fergus Falls
 Burns, F. M. Milan
 Burns, H. D. Albert Lea
 Burns, M. A. Milan
 Burns, R. M. St. Paul
 Burton, C. G. St. Paul
 Burton, J. L. Buhl
 Buscher, J. C. St. Cloud
 Bushard, W. J. Bird Island
 Busher, H. H. St. Paul
 Butler, John. Minneapolis
 Butler, J. K. Carlton
 Butt, H. R. Rochester
 Butturff, C. R. Freeborn
 Butzer, J. A. Mankato
 Buzelle, L. K. Minneapolis
 Cabell, C. L. Rochester
 Cable, M. L. Minneapolis
 Cabot, V. S. Minneapolis
 Cady, L. H. Minneapolis
 Cain, C. L. St. Paul
 Caine, C. E. Morris
 Cairns, R. J. Sanborn
 Caldwell, J. P. St. Paul
 Callahan, F. F. Albert Lea
 Callahan, F. F. Pokegama
 Callerstrom, G. W. Minneapolis
 Cameron, D. M. Rochester
 Cameron, Isabell L. Minneapolis
 Camp, J. D. Rochester
 Camp, W. E. Minneapolis
 Campbell, D. C. Rochester
 Campbell, L. M. Minneapolis
 Campbell, O. J. Minneapolis
 Canfield, W. W. Houston
 Cantwell, W. F. International Falls
 Cardie, A. E. Minneapolis
 Cardie, G. E. Brainerd
 Carey, J. B. Minneapolis
 Carlson, C. E. Aitkin
 Carlson, J. V. Westbrook
 Carlson, Lawrence. Minneapolis
 Carlson, L. T. Minneapolis
 Carlson, V. W. Blooming Prairie
 Carman, J. E. Detroit Lakes
 Caron, R. P. Minneapolis
 Carroll, W. C. St. Paul
 Carstens, C. F. Hibbing
 Caspers, C. G. Minneapolis
 Catlin, J. J. Buffalo
 Catlin, T. J. Buffalo
 Cavanor, F. T. Minneapolis
 Cepelcha, S. F. Redwood Falls
 Cervenka, C. F. New Prague
 Challman, S. A. Minneapolis
 Chadbourn, A. G. Heron Lake
 Chambers, W. C. Blue Earth
 Chapman, A. S. Rochester
 Chapman, T. L. Duluth
 Chatterton, C. C. St. Paul
 Chauncey, L. R. Rochester
 Cheney, E. L. Duluth
 Chermak, F. G. International Falls

Cherry, J. H. Rochester
 Chesley, A. J. St. Paul
 Christensen, E. E. Winona
 Christensen, E. P. Two Harbors
 Christensen, G. R. Minneapolis
 Christiansen, Andrew. St. Paul
 Christianson, H. W. Minneapolis
 Christie, G. R. Long Prairie
 Christison, J. T. St. Paul
 Chunn, S. S. Pipestone
 Clagett, O. T. Rochester
 Clark, F. F. Duluth
 Clark, H. B. St. Cloud
 Clark, H. B., Jr. St. Paul
 Clark, H. H. Minneapolis
 Clark, H. S. Minneapolis
 Clark, L. W. Spring Valley
 Clark, T. C. Minneapolis
 Clay, L. B. Minneapolis
 Claydon, D. R. Red Wing
 Claydon, H. F. Zumbrota
 Claydon, L. E. Red Wing
 Clegg, R. S. Rochester
 Clement, J. B. Lester Prairie
 Clement, T. G. Duluth
 Cleveland, W. H. Rochester
 Clifford, G. W. Alexandria
 Clifton, T. A. Chatfield
 Cochran, B. B. St. Paul
 Cochran, W. J. Lake City
 Cohen, B. A. Minneapolis
 Cohen, S. S. Oak Terrace
 Colby, W. L. St. Paul
 Cole, H. B. Redwood Falls
 Cole, J. G. Redwood Falls
 Cole, W. H. St. Paul
 Collier, H. G. St. Paul
 Collins, A. N. Duluth
 Collins, H. C. Duluth
 Collins, J. S. Wabasha
 Colvin, A. R. St. Paul
 Colyer, G. E. Rochester
 Combacker, L. C. Fergus Falls
 Comfort, M. W. Rochester
 Condit, W. H. Minneapolis
 Condon, W. B. Rochester
 Conner, H. M. Rochester
 Connor, C. E. St. Paul
 Conway, J. F. Rochester
 Cook, C. K. St. Paul
 Cook, E. N. Rochester
 Cook, H. W. Minneapolis
 Cook, J. M. Staples
 Coombs, C. H. Cass Lake
 Cooney, H. C. Princeton
 Cooper, C. C. St. Paul
 Cooper, M. D. Winnebago
 Cooperman, H. O. Minneapolis
 Corbett, J. F. Minneapolis
 Corniea, A. D. Minneapolis
 Corrigan, J. E. Waycross, Ga.
 Cosgriff, J. A. Olivia
 Cottam, G. G. Minneapolis
 Counseller, V. S. Rochester
 Countryman, R. S. St. Paul
 Covell, W. W. St. Peter
 Coventry, M. B. Rochester
 Coventry, W. A. Duluth
 Coventry, W. D. Duluth
 Cowern, E. W. North St. Paul
 Cragg, R. W. Rochester
 Craig, W. McK. Rochester
 Cranmer, R. R. Minneapolis
 Cranston, R. W. Minneapolis
 Creevy, C. D. Minneapolis
 Creighton, R. H. Minneapolis
 Crenshaw, J. L. Rochester
 *Cress, E. E. Boyd
 Cress, P. J. Ellsworth
 Crewe, J. E. Rochester
 Critchfield, L. R. St. Paul
 Cronwell, B. J. Austin
 Crow, E. R. Arlington
 Crumpacker, L. K. Rochester
 Culligan, J. M. St. Paul
 *Cumming, J. F. Morris
 Cunningham, B. P. Rochester
 Curtin, J. F. Minneapolis
 Curtis, R. A. Le Center
 Cusick, P. L. Rochester
 Cutts, George. Minneapolis

Dack, L. G. St. Paul
 Dady, E. E. Minneapolis
 Dahl, E. O. Minneapolis
 Dahl, G. A. Mankato

Dahl, J. A. Minneapolis
 Dahle, M. B. Glenwood
 Dahlin, I. T. Aurora
 Daignault, Oscar. Benson
 Daniel, D. H. Minneapolis
 Daniel, L. M. Minneapolis
 Danielson, K. A. Litchfield
 Danielson, Lennox. Litchfield
 Darling, J. P. Rochester
 Dart, L. O. Minneapolis
 Daugherty, E. B. Marine-on-St. Croix
 Daugherty, J. E. St. Paul
 Davies, R. J. Nopemung
 Davis, A. C. Rochester
 Davis, Herbert. St. Paul
 Davis, I. G. Rushford
 Davis, J. C. Minneapolis
 Davis, L. F. Wadena
 Davis, L. T. Wadena
 Davis, R. D. Clearbrook
 Davis, T. C. Wadena
 Davis, William. St. Paul
 Day, Lois A. Rochester
 Dearing, W. H., Jr. Rochester
 De Boer, Hermanus. Edgerton
 DeCoursey, D. M. St. Paul
 Dedolph, Karl. St. Paul
 Dedolph, T. H. Brahm
 Delavan, P. A. St. Paul
 Delmonico, E. J. Rochester
 Delmore, J. L., Jr. Roseau
 Delmore, J. L. Roseau
 del Plaine, C. W. Minneapolis
 Demo, P. W. Wells
 Denman, A. V. Mankato
 Derauf, B. I. St. Paul
 Derbyshire, R. C. Rochester
 Desjardins, A. U. Rochester
 Devereaux, T. J. Wayzata
 Dewey, D. H. Owatonna
 Dickson, T. H. St. Paul
 Diehl, H. S. Minneapolis
 Diessner, H. D. Minneapolis
 Dittman, G. C. St. Paul
 Dix, C. R. Rochester
 Dixon, C. F. Rochester
 Dockerty, M. B. Rochester
 Doehring, P. C., Jr. Rochester
 Doering, R. E. Minneapolis
 Dolder, F. C. Eyota
 Doleman, N. F. Tintah
 Doman, V. W. Lakefield
 Doms, H. C. A. Slayton
 Donald, C. J., Jr. Rochester
 Donaldson, C. S. Foley
 Donohue, P. F. St. Paul
 Donovan, D. L. Albert Lea
 Doolittle, L. E. Duluth
 Dordal, John. Sacred Heart
 Dorge, R. I. Minneapolis
 Dornblaser, H. B. Minneapolis
 Dorsey, G. C. Minneapolis
 Dorton, H. E. Rochester
 Doss, A. K. Rochester
 Dovere, C. M. St. Paul
 Dowswell, W. J. Kerkhoven
 Doney, G. L. Minneapolis
 Doyle, G. C. Duluth
 Doyle, L. O. Minneapolis
 Drake, C. B. St. Paul
 Drake, C. R. Minneapolis
 Drake, F. A. Lanesboro
 Dredge, H. P. Sandstone
 Drill, H. E. Hopkins
 Drips, Della G. Rochester
 Drought, W. W. Fergus Falls
 Dry, T. J. Rochester
 Dubbe, F. H. New Ulm
 Dublin, William. Rochester
 Du Bois, J. F. Sauk Centre
 Dudley, J. H. Windom
 Duff, E. R. Minneapolis
 Dugan, L. F. Faribault
 Dukelow, D. A. Minneapolis
 Dumas, A. G. Minneapolis
 Duncan, J. W. Moorhead
 Dungay, N. S. Northfield
 Dunlap, E. H. Minneapolis
 Dunn, G. R. Minneapolis
 Dunn, J. N. St. Paul
 Duryea, W. M. Minneapolis
 Dutton, C. E. Minneapolis
 Dvorak, B. A. Minneapolis
 Dwan, P. F. Minneapolis
 Dworsky, S. D. Minneapolis
 Dysterheit, A. F. Gaylord

*Deceased

Earl, George St. Paul
 Earl, J. R. St. Paul
 Earl, Robert. St. Paul
 East, John. Northome
 Eaton, L. M. Rochester
 Eberlin, E. A. Glenwood
 Eckhardt, C. L. Austin
 Eckman, P. F. Duluth
 Eckman, R. J. Duluth
 Ederer, J. J. Mahanomen
 Edlund, Gustaf. St. Paul
 Edwards, J. W. St. Paul
 Edwards, R. T. Elysian
 Edwards, T. J. St. Paul
 Eginton, C. T. Rochester
 Ehrenberg, C. J. Minneapolis
 Ehrlich, S. P. Minneapolis
 Eich, Matthew. Minneapolis
 Eiler, John. Park Rapids
 Eisenstadt, D. H. Minneapolis
 Eitel, G. D. Minneapolis
 Ekblad, J. W. Duluth
 Eklund, E. J. Norwood
 Elias, F. J. Duluth
 Elkins, E. C. Rochester
 Ellingson, A. R. Detroit Lakes
 Elliott, W. S. Virginia
 Ellis, E. W. Elgin
 Ellison, D. E. Minneapolis
 Ellison, F. E. Monticello
 Elsey, E. M. Glenwood
 Elsey, J. R. Glenwood
 Ely, O. S. So. St. Paul
 Emanuel, K. W. Duluth
 Emerson, E. C. St. Paul
 Emmerson, W. S. Mayer
 Emmett, J. L. Rochester
 Endress, E. K. St. Paul
 Engberg, E. J. Faribault
 Engdahl, F. W. Ortonville
 Engh, Sigfred. Jackson
 Englehart, P. C. Minneapolis
 English, J. P. Rochester
 Engle, D. E. Rochester
 Engstrand, O. J. Minneapolis
 Engstrom, G. F. Belgrade
 Eppard, R. M. Cloquet
 Erdmann, C. A. Minneapolis
 Erich, J. B. Rochester
 Erickson, A. O. Ivanhoe
 Erickson, Eskil. Halstad
 Erickson, R. E. Hector
 Erickson, R. F. Minneapolis
 Ericson, R. M. Minneapolis
 Ericson, Swan. Le Sueur
 Ericsson, M. G. Long Prairie
 Ernest, G. C. H. So. St. Paul
 Erskine, G. M. Grand Rapids
 Ertel, E. O. Ellendale
 Esheby, E. C. St. Paul
 Esser, John. Perham
 Esser, O. J. Gibbon
 Estrem, C. O. Fergus Falls
 Estrem, T. A. Hibbing
 Eusterman, G. B. Rochester
 Evans, E. T. Minneapolis
 Evans, L. M. Sauk Rapids
 Evans, R. D. Minneapolis
 Everts, A. B. Rochester
 Ewens, H. B. Virginia
 Ewing, C. F. Wheaton
 Eyres, T. E. Pequot

Faber, J. E. Rochester
 Fahey, E. W. St. Paul
 Fahr, G. E. Minneapolis
 Fait, R. V. Little Falls
 Fankboner, A. V. Buhl
 Fansler, W. A. Minneapolis
 Farrish, R. C. Sherburn
 Fawcett, A. M. Renville
 *Fawcett, C. E. Stewartville
 Fawcett, K. R. Duluth
 Feeney, J. M. Minneapolis
 Feinstein, J. Y. Cambridge
 Feldman, F. M. Rochester
 Fellows, M. F. Duluth
 Fenger, E. P. K. Oak Terrace
 Ferguson, J. C. St. Paul
 Ferris, D. O. Rochester
 Fessenmaier, O. B. New Ulm
 Fessler, H. H. St. Paul
 Fetterly, Warren. Minneapolis
 Feuling, J. C. Bovey
 Fiel, C. A., Jr. Rochester
 Figi, F. A. Rochester
 Fine, B. A. Winsted
 Fink, L. W. Minneapolis
 Fink, W. H. Minneapolis

*Fischer, H. P. Shakopee
 Fischer, M. McC. Duluth
 Fishback, C. F. Rochester
 Fisher, H. C. Rochester
 Fisher, I. I. Ceylon
 Fisher, J. M. Fergus Falls
 Fisketti, Henry. Duluth
 Fitzgerald, D. F. Minneapolis
 Fitzgerald, E. T. Morris
 Fitzsimons, W. E. Brainerd
 Fjeldstad, C. A. Minneapolis
 Flanagan, H. F. St. Paul
 Flanagan, L. G. Austin
 Flancher, L. H. Lake Park
 Fleming, A. S. Minneapolis
 Fleming, T. S. St. Cloud
 Flesche, B. A. Lake City
 Flinn, T. E. Redwood Falls
 Flom, M. G. Zumbrota
 Fogarty, C. W. St. Paul
 Fogelberg, E. J. St. Paul
 Foley, F. E. B. St. Paul
 Folken, F. G. Albert Lea
 Forbes, R. S. Duluth
 Ford, B. C. Marshall
 Ford, W. H. Minneapolis
 Foshager, H. T. Clara City
 Foster, W. K. Minneapolis
 Fowler, L. H. Minneapolis
 Franchere, F. W. Lake Crystal
 Francis, D. W. Morristown
 Frank, J. E. Marshall
 Frederick, G. M. Minneapolis
 Frederickson, Alice C. Willmar
 Frederickson, G. U. Y. Willmar
 Fredlund, M. L. Milaca
 Freeman, C. D. St. Paul
 Freeman, G. H. St. Peter
 Freeman, J. P. Albert Lea
 Freeman, W. L. St. Cloud
 Freeman, W. N. Perham
 Friedman, L. L. St. Paul
 Freligh, W. P. Albert Lea
 Fricke, R. E. Rochester
 Friedell, Aaron. Minneapolis
 Friedell, George. Russell
 Friedell, M. T. Rochester
 Friesleben, William. Sauk Rapids
 Frisch, F. P. Willmar
 Fritsche, Albert. New Ulm
 Fritsche, C. J. New Ulm
 Fritsche, T. R. New Ulm
 Fritz, W. L. St. Paul
 Fritzell, K. E. Minneapolis
 Froats, C. W. St. Paul
 Frost, E. H. Willmar
 Frost, H. T. Wadena
 Frost, J. B. Minneapolis
 Fugina, G. R. Mankato
 Fuller, Alice H. Minneapolis
 Funk, V. K. Oak Terrace
 Furst, J. N. Hallock

Gaarde, F. W. Rochester
 Gager, E. C. St. Paul
 Gaud, J. B. St. Cloud
 Gaines, E. C. Buffalo Lake
 Gallagher, B. J. Waseca
 Gamble, J. W. Albert Lea
 Gamble, P. M. Albert Lea
 Gammell, J. H. Minneapolis
 Garbrecht, A. W. St. Paul
 Gardiner, D. G. St. Paul
 Gardner, E. L. Minneapolis
 Gardner, J. W. Rochester
 Gardner, V. H. Fairmont
 Gardner, W. P. Anoka
 Garlock, A. V. Bemidji
 Garlock, D. H. Bemidji
 Garrow, D. M. St. Paul
 Garten, J. L. Minneapolis
 Garthe, J. J. Shakopee
 Geer, E. K. St. Paul
 Gehlen, J. N. St. Paul
 Geist, G. A. St. Paul
 Gendron, J. F. X. Grand Rapids
 Gerber, M. P. Brainerd
 Geromo, Charles. Balaton
 Ghent, C. H. St. Paul
 Ghormley, R. K. Rochester
 Ghostley, Mary C. Puposky
 Gibbons, F. C. Comfrey
 Gibbs, E. C. St. Paul
 Giere, E. O. Minneapolis
 Giere, J. C. Minneapolis
 Giere, R. W. Minneapolis
 Giere, S. W. Benson
 Giesen, A. F. Starbuck
 Giessler, P. W. Minneapolis
 Giffin, H. M. Rochester
 Giffin, H. Z. Rochester

Giffin, L. A. Rochester
 Gifford, B. L. Long Prairie
 Gilbert, M. G. Minneapolis
 Gilfillan, J. S. St. Paul
 Gilkey, S. E. St. Paul
 Gilles, F. L. Minneapolis
 Gillespie, M. G. Duluth
 Gillespie, N. H. Duluth
 Gilmore, Rowland. Bemidji
 Gingold, B. A. Minneapolis
 Ginsberg, William. St. Paul
 Giroux, A. A. Moose Lake
 Girvin, R. B. Minneapolis
 Glabe, R. A. Plainview
 Goblirsch, A. P. Sleepy Eye
 Goehrs, H. W. St. Cloud
 Golberg, M. L. Minneapolis
 Goldberg, I. M. Minneapolis
 Goldish, D. R. Duluth
 Goldman, T. I. Minneapolis
 Goltz, E. V. St. Paul
 Good, C. A., Jr. Rochester
 Good, H. D. Minneapolis
 Goodman, C. E. Virginia
 Goodson, W. H., Jr. Rochester
 Gordon, P. E. Minneapolis
 Gore, H. R. Rochester
 Goss, H. C. Glencoe
 Gosslee, G. L. Moorhead
 Gowan, L. R. Duluth
 Graham, Robert. Duluth
 Graham, R. W. Rochester
 Grandy, A. Margaret. Rochester
 Grant, H. W. St. Paul
 Gratzek, F. R. Minneapolis
 Gratzek, Thomas. St. Paul
 Grau, R. K. St. Paul
 Grave, Floyd. Minneapolis
 Graves, R. B. Red Wing
 Graves, W. N. Duluth
 Gray, F. D. Marshall
 Gray, H. K. Rochester
 Gray, R. C. Minneapolis
 Greene, L. F. Rochester
 Greenfield, W. T. Delano
 Gregg, R. O. Rochester
 Griffin, P. J. Fertile
 Grimes, B. P. St. Peter
 Grimes, H. B. Madelia
 Grimes, Marian. Minneapolis
 Grindlay, J. H. Rochester
 Grise, W. B. Austin
 Griswold, F. E. Hoffman
 Groff, J. E. Rochester
 Grogan, J. S. Wadena
 Gronvall, P. R. Minneapolis
 Groschupf, T. P. E. Bemidji
 Grose, F. N. Clarissa
 Gruenhagen, A. P. St. Paul
 Grundset, O. J. Montrose
 Gullixson, Andrew. Albert Lea
 Gully, R. J. Cambridge
 Gunderson, N. A. Minneapolis
 Gunderson, R. M. Lake Park
 Gunlaugson, F. G. Mankato
 Gushurst, E. G. Minneapolis
 Gustason, H. T. Minneapolis

Habein, H. C. Rochester
 Haberman, Emil. Osakis
 Hacking, F. H. Minneapolis
 Haessly, S. B. Faribault
 Hagaman, G. K. St. Paul
 Hagen, O. E. Butterfield
 Hagen, O. J. Moorhead
 Haggard, G. D. Minneapolis
 Haight, G. G. Audubon
 Haines, J. H. Stillwater
 Haines, S. F. Rochester
 Haisten, A. S. Rochester
 Halenbeck, P. L. St. Cloud
 Hall, A. E. Virginia
 Hall, A. R. St. Paul
 Hall, B. E. Rochester
 Hall, H. H. St. Paul
 Hall, J. M. Minneapolis
 Halladay, G. J. Brainerd
 Hallberg, C. A. Minneapolis
 Hallenbeck, D. F. Rochester
 Haller, W. M. Bemidji
 Hallock, Philip. Minneapolis
 Halloran, W. H. Jackson
 Halpern, D. J. Brewster
 Halpin, J. E. Rush City
 Hamel, A. L. Minneapolis
 Hamilton, A. S. Minneapolis
 Hamlin, G. B. Minneapolis
 Hamlon, J. S. St. Charles
 Hammar, L. M. Butterfield
 Hammer, H. J. Rochester
 Hammermeister, T. F. New Ulm

*Deceased

Hammerstad, L. M.	Minneapolis	Helland, G. M.	Spring Grove	Howard, M. A.	St. Paul
Hammes, E. M.	St. Paul	Helland, J. W.	Spring Grove	Howard, M. I.	Mankato
Hammond, A. J. H.	Minneapolis	Helmholz, H. F.	Rochester	Howard, W. S.	St. Paul
Hammond, J. F.	St. Paul	Helseth, H. K.	Thief River Falls	Howe, R. F.	Rochester
*Hand, W. R.	Elbow Lake	Hempstead, B. E.	Rochester	Howell, L. P.	Rochester
Haney, C. L.	Duluth	Hemstead, Werner.	Brainerd	Hoyer, L. J.	Windom
Hankerson, R. G.	Minnesota Lake	Hench, P. S.	Rochester	Hubbard, O. E.	Brainerd
Hannah, H. B.	Minneapolis	Henderson, A. J. G.	Kiester	Hubin, E. G.	Deerwood
Hannover, R. D.	Littlefork	Henderson, J. W.	Rochester	Hudec, E. R.	Echo
Hansen, C. O.	Minneapolis	Henderson, M. S.	Rochester	Hudson, G. E.	Minneapolis
Hansen, E. W.	Minneapolis	Hendricks, Esten.	Minneapolis	Huenekens, E. J.	Minneapolis
Hansen, Olga S.	Minneapolis	Hendrickson, J. F.	Minneapolis	Huffington, H. L.	Mankato
Hansen, Rorbye	Monticello	Hendrickson, R. R.	Wabasha	Hullsick, R. B.	St. Paul
Hanson, A. M.	Faribault	Hengstler, W. H.	St. Paul	Hultkrans, J. C.	Minneapolis
*Hanson, E. C.	Austin	Henney, W. H.	McIntosh	Hultkrans, R. E.	Minneapolis
Hanson, E. O.	Cloquet	Henriksen, H. G.	Northfield	Hummer, G. J.	Rochester
Hanson, E. C.	New York Mills	Henrikson, E. C.	Minneapolis	Humphrey, E. W.	Moorhead
Hanson, H. B.	St. Paul	Henry, C. E.	Minneapolis	Humphrey, W. R.	Stillwater
Hanson, H. J.	Minneapolis	Henry, C. J.	Milaca	Hunt, A. B.	Rochester
Hanson, H. V.	Minneapolis	Henry, M. O.	Minneapolis	Hunt, R. C.	Fairmont
Hanson, M. B.	Minneapolis	Hensel, C. N.	St. Paul	Hunte, A. F.	Bylas, Ariz.
Hanson, W. A. H.	Minneapolis	Henslin, A. E.	Le Roy	Hurd, Annah.	Minneapolis
Happe, L. J.	Minneapolis	Herbert, W. L.	Granite Falls	Hursh, M. M.	Hibbing
Hargis, W. H., Jr.	Rochester	Herbolzheimer, A. J.	Minneapolis	Hutchinson, C. J.	Minneapolis
Hargraves, M. M.	Rochester	Herbst, R. F.	Tofte	Hutchinson, Henry.	Moose Lake
Harley, R. D.	Rochester	Herman, A. L.	Minneapolis	Huxley, F. R.	Faribault
Harlow, H. D.	Virginia	Herman, Samuel.	St. Paul	Hymes, Charles.	Minneapolis
Harmon, G. E.	St. Paul	Hermanson, P. E.	Hendricks	Hynes, J. E.	Minneapolis
Harper, S. B.	Rochester	Heron, R. C.	St. Paul	Ide, A. W.	St. Paul
Harriman, Leonard.	Howard Lake	Herrell, W. E.	Rochester	Ikeda, Kano.	St. Paul
Harrington, C. D.	Minneapolis	Herrmann, E. T.	St. Paul	Ingebrigtsen, E. K. G.	Moorhead
Harrington, F. E.	Minneapolis	Hertel, G. E.	Austin	Ingerson, C. A.	St. Paul
Harrington, S. W.	Rochester	Hertz, C. S.	Rochester	Irvine, H. G.	Minneapolis
Harris, C. N.	Hibbing	Hewitt, R. M.	Rochester	Jackman, R. J.	Rochester
Harris, L. D.	Minneapolis	Heyerdale, O. C.	Rochester	Jackson, C. M.	Minneapolis
Harrison, M. W.	Rochester	Heyerdale, W. W.	Rochester	*Jacobs, A. C.	Elmore
Harrison, P. W.	Worthington	Hiebert, H. L.	Ah-Gwah-Ching	Jacobs, D. L.	Willmar
Hart, V. L.	Minneapolis	Hiebert, J. P.	Minneapolis	Jacobs, G. C.	Fergus Falls
Hart, W. E.	Monticello	Higgs, W. W.	Park Rapids	Jacobs, J. C.	Willmar
Hartiel, W. F.	St. Paul	Higgins, J. H.	Minneapolis	Jacobs, L. G.	Winona
Hartley, E. C.	St. Paul	Hildebrand, Alice G.	Rochester	Jacobson, Clarence.	Chisholm
Hartman, H. R.	Rochester	Hilding, A. C.	Duluth	Jacobson, D. J.	Bemidji
Hartmann, C. M.	Fairfax	Hilger, A. W.	St. Paul	Jacquot, G. L.	Marshall
Hartnagel, G. F.	Red Wing	Hilger, D. D.	St. Paul	Jamieson, E. F.	Brainerd
Hartung, E. H.	Claremont	Hilger, L. A.	St. Paul	Jennings, Mary H.	Minneapolis
Hartzell, T. B.	Minneapolis	Hill, Eleanor J.	Minneapolis	Jenovec, J. F.	Rochester
Haskell, A. D.	Alexandria	Hill, F. R.	Duluth	Jensen, A. H.	Hutchinson
Hassett, M. F.	St. Paul	Hilleboe, H. E.	St. Paul	Jensen, A. M.	Brownston
Hassett, R. G.	Mankato	Hillis, S. J.	Minneapolis	Jensen, H. C.	Minneapolis
Hastings, D. R.	Minneapolis	Hines, E. A., Jr.	Rochester	Jensen, H. H.	Atwater
Hatch, W. E.	Duluth	Hiniker, L. P.	St. Paul	Jensen, M. J.	Minneapolis
Hathaway, S. J.	Proctor	Hiniker, P. J.	Le Sueur	Jensen, R. M.	Rochester
Hauge, M. I.	Clarkfield	Hinshaw, H. C.	Rochester	Jensen, T. J.	Duluth
*Hauge, M. M.	Clarkfield	Hirschboeck, F. J.	Duluth	Jesio, J. W.	St. Paul
Haugen, J. A.	Minneapolis	Hirschfelder, A. D.	Minneapolis	Johanson, W. G.	St. Paul
Haugseth, Enoch.	Twin Valley	Hirschfield, M. S.	Duluth	Johnson, A. B.	Minneapolis
Hauser, V. P.	St. Paul	Hirshfield, F. R.	Minneapolis	Johnson, A. E.	Red Wing
Havel, H. W.	Jordan	Hitchings, W. S.	Lakefield	Johnson, A. E.	Minneapolis
Havel, T. E.	Blue Earth	Hoaglund, A. W.	Minneapolis	Johnson, A. M.	St. Paul
Haven, W. K.	Minneapolis	Hobbs, C. A.	Minneapolis	Johnson, C. E.	Pine River
Havens, F. Z.	Rochester	Hochfilzer, J. J.	St. Paul	Johnson, C. E.	St. Paul
Havens, J. G. W.	Austin	Hodapp, R. J.	Willmar	Johnson, C. M.	Dawson
Haverfield, Addie R.	Minneapolis	Hodge, S. V.	Minneapolis	Johnson, D. L.	Little Falls
Hawkins, V. J.	St. Paul	Hodgson, H. H.	Crookston	Johnson, D. W.	Fairmont
Hawkinson, R. P.	Minneapolis	Hoff, Alfred.	St. Paul	Johnson, E. W.	Bemidji
Hawn, H. W.	Rochester	Hoff, H. O.	Duluth	Johnson, E. W.	Minneapolis
Hayden, R. O.	Rochester	Hoffert, H. E.	Minneapolis	Johnson, H. C.	North Mankato
Hayes, J. M.	Minneapolis	Hoffman, M. H.	St. Paul	Johnson, H. C.	Thief River Falls
Hayes, M. F.	Nashwauck	Hoffman, H. O. E.	Rochester	Johnson, Hans.	Kerkhoven
Hays, A. T.	Minneapolis	Hoffman, R. A.	Minneapolis	Johnson, H. A.	Minneapolis
Hays, T. P.	Minneapolis	Hoffman, W. L.	Minneapolis	Johnson, H. P.	Fairmont
Head, D. B.	Minneapolis	Hoidale, A. D.	Tracy	Johnson, H. P.	Harmony
Head, G. D.	Minneapolis	Holbrook, J. S.	Mankato	Johnson, J. A.	St. Paul
Heath, A. C.	Stillwater	Holcomb, J. T.	St. Paul	Johnson, J. A.	Minneapolis
Hebbel, Robert.	Windom	Holcomb, O. W.	St. Paul	Johnson, Julius.	Minneapolis
Hebeisen, M. B.	Chaska	Holdridge, G. A.	Foley	Johnson, K. E.	Duluth
Heck, F. J.	Rochester	Holl, P. M.	Minneapolis	Johnson, N. A.	Minneapolis
Heck, W. W.	St. Paul	Hollands, W. H.	Fisher	Johnson, N. P.	Minneapolis
Hedback, A. E.	Minneapolis	Hollister, C. B. H.	Rochester	Johnson, N. T.	Minneapolis
Hedberg, G. A.	Nopemring	Holm, P. F.	Wells	Johnson, O. H.	Redwood Falls
Hedemark, H. H.	Thief River Falls	Holmberg, C. J.	Minneapolis	Johnson, O. J.	Lyle
Hedenstrom, F. G.	St. Paul	Holmberg, L. J.	Canby	Johnson, O. V.	Fergus Falls
Hedenstrom, L. H.	Cambridge	Holmen, R. W.	St. Paul	Johnson, P. C.	Tyler
Hedin, R. F.	Chicago, Ill.	Holmes, A. E.	Rush City	Johnson, R. A.	Minneapolis
Heersema, P. H.	Rochester	Holmstrom, C. H.	Warren	Johnson, R. B.	Lanesboro
Hegge, O. H.	Austin	Holst, C. F.	Little Falls	Johnson, R. E.	Minneapolis
Hegge, R. S.	Austin	Holst, J. B.	Little Falls	Johnson, R. E.	Worthington
Heiam, W. C.	Cook	Holt, G. W.	Wabasha	Johnson, R. G.	Stillwater
Heiberg, E. A.	Fergus Falls	Holt, J. E.	St. Paul	Johnson, S. M.	Minneapolis
Heilman, Charles.	Rochester	Holt, W. B.	Minneapolis	Johnson, T. H.	San Francisco, Calif.
Heilman, Dorothy M. H.	Rochester	Holtan, Theodore.	Waterville	Johnson, Walfred.	Sauk Centre
Heilman, F. R.	Rochester	Holzappel, F. C.	Minneapolis	Johnson, W. E.	Morgan
Heim, R. R.	Minneapolis	Hopkins, G. W.	St. Paul	Johnson, Y. T.	Minneapolis
Heimark, J. J.	Fairmont	Horton, B. T.	Rochester	Johnston, L. F.	Slayton
*Heimark, O. E.	Duluth	Hottinger, R. C.	Janesville	Jolin, F. M.	Coleraine
Heise, Herbert	Winona	Houkom, Blaine.	Minneapolis	Jolin, R. V.	Grand Rapids
Heise, W. F. C.	Winona	House, Z. E.	Cass Lake	Jones, A. W.	Red Wing
Heise, W. V.	Winona	Houston, D. M.	Park Rapids	Jones, E. M.	St. Paul
Helferty, J. K.	Tracy	Hovde, Rolf.	Winthrop	Jones, G. M.	Minneapolis
		Hovland, M. L.	Minneapolis	Jones, H. W.	Minneapolis

*Deceased

Jones, H. W., Jr. Minneapolis
 Jones, O. H. Madison Lake
 Jones, R. N. St. Cloud
 Jones, W. R. Minneapolis
 Jordan, L. S. Granite Falls
 Josephich, Alexander. Minneapolis
 Josewick, R. J. Stillwater
 Joyce, G. L. Rochester
 Judd, E. S., Jr. Rochester
 Juergens, H. M. Belle Plaine
 Juers, E. H. Red Wing
 Juliar, R. O. St. Clair
 Jump, W. C. Kasson
 Just, H. J. Lafayette

Kaasa, L. J. Albert Lea
 Kalin, O. T. Minneapolis
 Kalinoff, Demeter. Stillwater
 Kamman, G. R. St. Paul
 Kamp, B. A. Albert Lea
 Kannary, E. L. St. Paul
 Kanne, C. W. Faribault
 Kapernick, J. S. Rochester
 Kaplan, D. H. St. Paul
 Karlstrom, A. E. Minneapolis
 Karn, B. R. Ortonville
 Kasper, E. M. St. Paul
 Kath, R. H. Woodlake
 Kaufman, E. J. Appleton
 Kaufman, W. B. Mankato
 Kaufman, W. C. Appleton
 Kearney, R. W. Rochester
 Keating, F. R., Jr. Rochester
 Keefe, R. E. St. Paul
 Keith, H. M. Rochester
 Keith, N. M. Rochester
 Kelby, G. M. Minneapolis
 Kelly, B. W. Atkin
 Kelly, J. V. St. Paul
 Kelly, P. H. St. Paul
 Kelsey, C. G. Hinckley
 Kemp, A. F. Mankato
 Kemp, M. W. Moose Lake
 Kenefick, E. V. St. Paul
 Kennedy, C. C. Minneapolis
 Kennedy, Jane F. Minneapolis
 Kennedy, R. L. J. Rochester
 Kennedy, W. A. St. Paul
 Kenyon, T. J. St. Paul
 Kepler, E. J. Rochester
 Kerkhof, A. C. Minneapolis
 Kerlan, Irvin. Washington, D. C.
 Kern, M. J. St. Cloud
 Kernohan, J. W. Rochester
 Kerschbaumer, Luisa. St. Peter
 Kershner, C. M. Rochester
 Kertes, Geza. Minneapolis
 Kesting, Herman. St. Paul
 Kettlewell, R. B. Sauk Centre
 Keyes, J. D. Winona
 Kibbe, O. A. Minneapolis
 Kibler, J. M. Rochester
 Kierland, P. E. Alexandria
 Kierland, R. R. Rochester
 Kiesling, I. H. Nashauk
 Kilbride, E. A. Worthington
 Kilbride, J. S. Worthington
 Killins, J. A. Rochester
 Kimmel, J. C., Jr. Rochester
 Kindschi, L. G. Rochester
 King, E. A. Minneapolis
 King, G. L. St. Paul
 King, H. E. Rochester
 King, H. T. Minneapolis
 King, W. L. M. Rochester
 Kingsbury, E. M. Clearwater
 Kinsella, T. J. Minneapolis
 Kirk, G. P. East Grand Forks
 Kirkin, B. R. Rochester
 Kirkin, O. L. Rochester
 Kistler, A. J. Minneapolis
 Kistler, C. M. Minneapolis
 Klein, A. D. Chisholm
 Klein, Harry. Duluth
 Klein, H. N. St. Paul
 Klein, J. C. Shakopee
 Knapp, F. N. Duluth
 Knapp, M. E. Minneapolis
 Knauff, M. K. St. Paul
 Knight, R. R. Minneapolis
 Knight, R. T. Minneapolis
 Knights, J. A. Bemidji
 Knutson, G. A. Greenbush
 Koelsche, G. A. Rochester
 Koepcke, G. M. Minneapolis
 Koepsell, A. A. H. St. Paul
 Kohlbry, C. O. Duluth
 Kohler, D. W. St. Joseph
 Kolars, J. J. Le Center

Koller, H. M. Minneapolis
 Koller, L. R. Minneapolis
 Koop, S. H. Richmond
 Korchik, J. P. Minneapolis
 Kortsch, F. P. Prior Lake
 Kostick, W. R. Fertile
 Kotchevar, F. R. Eveleth
 Koucky, R. W. Minneapolis
 Kowallis, G. F. Rochester
 Kozberg, Oscar. Moose Lake
 Kraft, Peter. Duluth
 Krause, C. W. Fairmont
 Kreuzer, T. C. Owatonna
 Krusen, F. H. Rochester
 Kucera, F. J. Hopkins
 Kucera, S. T. Lonsdale
 Kucera, W. J. Minneapolis
 Kugler, A. A. St. Paul
 Kuhlmann, August. Melrose
 Kurtin, H. J. Lonsdale
 Kusske, A. L. New Ulm
 Kuth, J. R. Duluth
 Kvale, W. F. Rochester
 Kvitrud, Gilbert. St. Paul
 Kyser, F. A. Rochester

La Bree, R. H. Chisholm
 Laird, A. T. Nopeming
 Lajoie, J. M. Minneapolis
 Lamb, H. L. Little Falls
 Lander, H. H. Rochester
 Lang, L. A. Minneapolis
 Langenderfer, F. V. St. Paul
 Langhoff, A. H. Glencoe
 Langmack, W. A. Cloquet
 Lannin, J. C. Mabel
 Lapiere, A. P. Minneapolis
 *Lapiere, C. A. Minneapolis
 Lapiere, J. T. Minneapolis
 Larsen, C. L. St. Paul
 Larsen, F. W. Minneapolis
 Larsen, O. O. Detroit Lakes
 Larson, Arnold. Detroit Lakes
 Larson, C. M. Minneapolis
 Larson, J. T. Lake Wilson
 Larson, L. J. Bagley
 Larson, L. M. Minneapolis
 Larson, L. M. Oak Terrace
 Larson, P. N. Minneapolis
 La Vake, R. T. Minneapolis
 Lax, M. H. St. Paul
 Laymon, C. W. Minneapolis
 Lazar, H. L. Minneapolis
 Leahy, Bartholomew. St. Paul
 Leary, W. V. Rochester
 Leavenworth, R. O. St. Paul
 Leavitt, H. H. Minneapolis
 Lebowske, J. A. Minneapolis
 Leck, P. C. Austin
 LeClercq, G. T. A. Boston, Mass.
 Leddy, E. T. Rochester
 Lee, H. M. Minneapolis
 Lee, H. W. Brainerd
 Lee, J. L. Watertown
 Lee, W. A. Fergus Falls
 Lee, W. N. Madison
 Leemhuis, G. H. McGregor
 Leffel, J. M., Jr. Rochester
 Leibold, H. H. Parkers Prairie
 Leick, R. M. St. Paul
 Leighton, Robert. Evansville
 Leitch, Archibald. St. Paul
 Leitch, N. M. Warroad
 Leland, H. R. Minneapolis
 Leland, J. A. C., Jr. Minneapolis
 Leland, J. T. Herman
 Lemon, W. S. Rochester
 Lenander, M. E. St. Peter
 Lenarz, A. J. Browerville
 Lende, Norman. Faribault
 Lenont, C. B. Virginia
 Lenz, J. R. Morton
 Lenz, O. A. Minneapolis
 Leonard, L. J. Minneapolis
 Leonard, Samuel. Minneapolis
 Leopard, B. A. Albert Lea
 Lepak, F. J. Duluth
 Lepak, J. A. St. Paul
 Lerche, William. Cable, Wis.
 Leven, N. L. St. Paul
 Levin, B. G. St. Paul
 Levitt, G. X. St. Paul
 Lewis, A. J. Henning
 Lewis, C. B. St. Cloud
 Lewis, E. B. Rochester
 Lexa, F. J. Lonsdale
 Libert, J. N. St. Cloud
 Lick, C. L. St. Paul
 Liedloff, A. G. Mankato
 Lien, R. J. Rochester
 Liffrog, W. W. Goodhue

Lillehei, E. J. Robbinsdale
 Lillie, H. I. Rochester
 Lima, L. R. Montevideo
 Lind, C. J. Minneapolis
 Lindberg, A. L. Wheaton
 Linde, Herman. Cyrus
 Lindgren, R. C. Minneapolis
 Linqquist, R. H. Minneapolis
 Lindsay, W. V. Winona
 Linner, H. P. Minneapolis
 Linton, W. B. Minneapolis
 Lippman, E. S. Minneapolis
 Lippman, H. S. St. Paul
 Lippmann, E. W. Hutchinson
 Lipschultz, Oscar. Minneapolis
 Lipscomb, P. R. Rochester
 Litchfield, J. T. Minneapolis
 Litman, A. B. Minneapolis
 Litman, S. N. Duluth
 Little, A. G., Jr. Rochester
 Little, E. H. Rochester
 Little, W. J. St. Paul
 Litzenberg, J. C. Minneapolis
 Lloyd, H. J. Mankato
 Lloyd, S. J. Rochester
 Lochead, D. C. Rochester
 Lockwood, W. W. Fort Peck, Mont.
 Logan, A. H. Rochester
 Logan, G. B. Rochester
 Logefeil, R. C. Minneapolis
 Lohmann, J. G. Jasper
 Loken, Theodore. Ada
 Lommen, P. A. Austin
 Long, Jesse. Minneapolis
 Loofbourrow, E. H. Keewatin
 Loomis, E. A. Minneapolis
 Loomis, G. L. Winona
 Love, F. A. Carlos
 Love, J. G. Rochester
 Love, W. R. Rochester
 Lovelace, W. R. Rochester
 Lovelady, S. B. Rochester
 Lowe, E. R. So. St. Paul
 Lowe, T. A. So. St. Paul
 Lowry, Elizabeth C. Minneapolis
 Lowry, Thomas. Minneapolis
 Luden, Georgine
 Victoria, B. C., Canada

Luedtke, G. H. Fairmont
 Lufkin, N. H. Minneapolis
 Lund, C. J. T. Underwood
 Lundblad, R. A. Minneapolis
 Lundblad, S. W. Minneapolis
 Lundgren, A. C. Minneapolis
 Lundholm, A. M. St. Paul
 Lundquist, E. F. Minneapolis
 Lundy, J. S. Rochester
 Lutz, E. H. Willmar
 Lyght, C. E. Northfield
 Lynch, F. W. St. Paul
 Lynch, M. J. Minneapolis
 Lynch, R. C. Rochester
 Lynde, O. G. Thief River Falls
 Lysne, Henry. Minneapolis
 Lysne, Myron. Minneapolis

Macbeth, J. L. St. Clair
 MacDonald, A. E. Minneapolis
 MacDonald, D. A. Minneapolis
 Macey, H. B. Rochester
 Macfarlane, P. H. Chisholm
 Mach, F. B. Minneapolis
 Mack, J. J. Little Rock, Ark.
 MacKay, A. R. Rochester
 MacKinnon, D. C. Minneapolis
 Macklin, W. E., Jr. Litchfield
 MacLean, A. R. Rochester
 Macnie, J. S. Minneapolis
 MacRae, G. C. Duluth
 Madden, J. F. St. Paul
 Madding, G. F. Rochester
 Mader, J. W. Rochester
 Maeder, E. C. Minneapolis
 Magath, T. B. Rochester
 Magney, F. H. Duluth
 Magnusen, A. E. Graceville
 Mahle, D. G. Plainview
 Mahowald, Aloys. Albany
 Maino, C. R. Rochester
 Maitland, D. P. Jackson
 Maitland, E. T. Jackson
 Maland, C. O. Minneapolis
 Malerich, J. A. Shakopee
 Malmstrom, J. A. Virginia
 Manley, J. R. Duluth
 Mann, F. C. Rochester
 Marclew W. J. Nopeming
 Marcum, E. H. Bemidji
 Mariette, E. S. Oak Terrace
 Mark, D. B. Minneapolis
 Marken, M. H. Fairmont

*Deceased.

Marking, G. H. Osseo
 Markoe, J. C. St. Paul
 Marks, R. W. St. Paul
 Martin, E. T. Duluth
 Martin, T. P. Arlington
 Martin, W. C. Duluth
 Martineau, J. L. St. Paul
 Martinson, C. J. Wayzata
 Masson, D. M. Rochester
 Masson, J. C. Rochester
 Matchan, G. R. Minneapolis
 Matthews, Justus. Minneapolis
 Mattill, P. M. Oak Terrace
 Mattison, P. A. Winona
 Mattson, C. H. St. Paul
 Mattson, H. A. N. Minneapolis
 Maun, M. E. St. Paul
 Maxeiner, S. R. Minneapolis
 May, W. H. Minneapolis
 Mayne, R. M. Duluth
 *Mayo, C. H. Rochester
 Mayo, C. W. Rochester
 *Mayo, W. J. Rochester
 Maytum, C. K. Rochester
 McBroom, D. E. Cambridge
 McCallig, J. J. Rochester
 McCann, D. F. Bemidji
 McCann, E. J. St. Paul
 McCannel, D. A. Rochester
 McCarten, F. M. Stillwater
 McCarthy, Donald. Minneapolis
 McCarthy, J. J. St. Paul
 McCarthy, W. J. Madelia
 McCarthy, W. R. St. Paul
 McCartney, J. S. Minneapolis
 McCarty, P. D. Ely
 McCarty, W. C. Rochester
 McClanahan, J. H. White Bear Lake
 McClanahan, T. S. White Bear Lake
 McComb, C. F. Duluth
 McCoy, Mary K. Duluth
 McCrimmon, H. P. Minneapolis
 *McCrea, James. Fulda
 McCullough, J. A. L. Rochester
 McDaniel, Orianna. Minneapolis
 McDaniel, S. P. Virginia
 McDonald, A. L. Duluth
 McDonald, J. R. Rochester
 McDonough, F. E. Rochester
 McDowell, J. P. St. Cloud
 McElmeel, E. F. Pipestone
 McEnaney, C. T. Owatonna
 McFarland, A. H. Minneapolis
 McGandy, R. F. Minneapolis
 McGeary, G. E. Minneapolis
 McGroarty, J. J. Easton
 McGuigan, H. T. Red Wing
 McHaffie, O. L. Duluth
 McHeffy, G. J. Rochester
 McInerney, M. W. Minneapolis
 McIntire, H. M. Waseca
 McIntyre, George. Long Beach, Calif.
 McIntyre, J. A. Owatonna
 McIver, B. A. Lowry
 McKaig, C. B. Pine Island
 McKean, F. F. Delavan
 McKean, R. S. Rochester
 McKelvey, J. L. Minneapolis
 McKenna, J. K. Austin
 McKenna, M. J. Grand Rapids
 McKenzie, C. H. Minneapolis
 McKeon, J. O. Montgomery
 McKinlay, C. A. Minneapolis
 McKinley, J. C. Minneapolis
 McKinney, F. S. Minneapolis
 McKinnon, D. A., Jr. Rochester
 McLane, Evelyn G. Jackson
 McLane, W. O. Perham
 McLaren, Jennette M. Minneapolis
 McLaughlin, E. M. Winona
 McLennan, C. E. Minneapolis
 McLeod, J. L. Grand Rapids
 McLoughlin, C. J. Rochester
 McMahon, L. H. Breckenridge
 McMahon, M. J. Green Isle
 McManamy, E. P. Rochester
 McNevin, C. F. St. Paul
 McNutt, J. R. Duluth
 McPheeters, H. O. Minneapolis
 McQuarrie, Irvine. Minneapolis
 Mead, C. H. Duluth
 Meade, J. R. St. Paul
 Mears, B. J. St. Paul
 Medelman, J. P. St. Paul
 Meinert, A. E. Winona
 Meland, E. L. Minneapolis
 Melby, Bendik. Blooming Prairie
 Melby, O. F. Thief River Falls
 Melzer, G. R. Lyle
 *Deceased

Mercil, W. F. Crookston
 Merkert, C. E. Minneapolis
 Merkert, G. L. Minneapolis
 Merrill, Elisabeth. Minneapolis
 Merrill, Robert. Morris
 Merriman, L. L. Duluth
 Merritt, W. A. Rochester
 Mesker, G. H. Olivia
 Meyer, A. A. Minneapolis
 Meyer, E. L. Minneapolis
 Meyer, F. C. Kenyon
 Meyer, J. O. Grand Rapids
 Meyer, P. F. Faribault
 Meyerding, E. A. St. Paul
 Meyerding, H. W. Rochester
 Michael, J. C. Minneapolis
 Michel, H. H. Minneapolis
 Michelson, H. E. Minneapolis
 Mickelson, J. C. Mankato
 Miller, E. W. St. Peter
 Miller, H. A. P. Fairmont
 Miller, H. E. Minneapolis
 Miller, J. C. Minneapolis
 Miller, J. M. Rochester
 Miller, V. I. Mankato
 Miller, W. A. New York Mills
 Mills, J. L. Winnebago
 Milton, J. S. Minneapolis
 Miners, G. A. Deer River
 Mingo, F. E. Hugo
 Mitby, I. L. Aitkin
 Mitchell, E. C. Minneapolis
 Mitchell, R. S. Grand Meadow
 Moberg, C. W. Detroit Lakes
 Moe, J. H. Minneapolis
 Moe, R. J. Duluth
 Moe, Thomas. Moose Lake
 Moen, J. K., Jr. Minneapolis
 Moersch, F. P. Rochester
 Moersch, H. J. Rochester
 Moga, J. A. St. Paul
 Moir, W. W. Minneapolis
 Molander, H. A. St. Paul
 Mollers, T. P. Mountain Iron
 Monroe, P. B. Two Harbors
 Monson, E. M. Minneapolis
 Monson, L. J. Canby
 Monserud, N. O. Cloquet
 Montgomery, Hamilton. Rochester
 Mooney, L. P. Graceville
 *Moorehead, Martha B. Minneapolis
 Moos, D. J. St. Cloud
 Moquin, Marie A. St. Paul
 More, C. W. Eveleth
 Morehead, D. E. Owatonna
 Moren, Edward. Minneapolis
 Morgan, H. O. Amboy
 Moriarty, Berenice. St. Paul
 Moriarty, Cecile R. St. Paul
 Morissette, Leopold. Rochester
 Mork, B. O., Jr. Worthington
 Mork, B. O., Sr. Worthington
 Mork, F. E. Anoka
 Morley, G. A. Crookston
 Morlock, C. G. Rochester
 Morrison, A. W. Minneapolis
 Morrison, Charlotte J. Minneapolis
 Morrissey, F. B. St. Paul
 Morrow, J. J. Austin
 Morse, M. P. Le Roy
 Morse, R. W. Minneapolis
 Morsman, L. W. Hibbing
 Mortensbak, H. E. Hanska
 *Morton, H. McI. Vincentown, N. J.
 Mosby, M. E. Long Prairie
 Moses, Joseph, Jr. Northfield
 Mountain, G. E. Rochester
 Moutritsen, G. J. Fergus Falls
 Moss, M. N. St. Paul
 Mousel, L. H. Rochester
 Moyer, R. E. Faribault
 *Moynihan, T. J. St. Paul
 Mueller, R. F. Two Harbors
 Mueller, Selma C. Duluth
 Muir, W. F. Graceville
 Muller, R. T. St. Paul
 Mulligan, A. M. Brainerd
 Mulrooney, R. E. Rochester
 Munn, Elizabeth L. Rochester
 Murphy, E. P. Minneapolis
 Murphy, I. J. Minneapolis
 Murray, R. A. Aitkin
 Musachio, N. F. Milaca
 Mussey, R. D. Rochester
 Myers, J. A. Minneapolis
 Myers, Thomas. St. Paul
 Myre, C. R. Paynesville

Naegeli, A. E. St. Paul
 Naegeli, Frank. Fergus Falls
 Nagel, H. D. Waconia

Nash, L. A. Rochester
 Naslund, A. W. St. Paul
 Nass, H. A. Mabel
 Nauth, W. W. Winona
 Neal, J. M. Minneapolis
 Nealy, D. E. Adrian
 Neary, R. P. Minneapolis
 Neel, H. B. Rochester
 Neff, W. S. Virginia
 *Neher, F. H. St. Paul
 Nehring, J. P. Preston
 *Neilson, H. F. Minneapolis
 Nelson, E. H. Chisholm
 Nelson, E. J. Owatonna
 Nelson, H. E. Crookston
 Nelson, H. S. Excelsior
 Nelson, K. L. Minneapolis
 Nelson, L. A. St. Paul
 Nelson, M. S. Granite Falls
 Nelson, N. H. Minneapolis
 Nelson, N. P. Brainerd
 Nelson, O. L. N. Minneapolis
 Nelson, R. L. Duluth
 Nelson, W. I. Minneapolis
 Nelson, W. O. B. Fergus Falls
 Nesbitt, Samuel. Rochester
 Neumaier, Arthur. Lindstrom
 Neumann, C. A. Winona
 New, G. B. Rochester
 Newhart, Horace. Minneapolis
 Nichols, A. E. St. Paul
 Nicholson, M. A. Duluth
 Nickell, W. R. Rochester
 *Niles, L. J. Rollingstone
 Nilson, H. J. North Mankato
 Nissen, A. S. St. Peter
 Noble, J. F. St. Paul
 Noble, J. L. St. Paul
 Nordholm, V. W. Ellsworth, Wis.
 Nordin, G. T. Minneapolis
 Nordland, Martin. Minneapolis
 Nordman, W. F. Mora
 Norman, J. F. Crookston
 Norris, N. T. Caledonia
 Noth, H. W. Minneapolis
 Novak, E. E. New Prague
 Nuebel, C. J. St. Paul
 Nuessle, W. G. Springfield
 Nuetzman, A. W. Faribault
 Nutting, R. E. Duluth
 Nydahl, M. J. St. Paul
 Nye, Katherine A. St. Paul
 Nye, Lillian L. St. Paul
 Nygren, W. T. Brahm
 Nylander, E. G. Minneapolis
 Nystrom, Ruth G. Minneapolis

Oberg, C. M. Minneapolis
 O'Brien, J. P. Rochester
 O'Brien, W. A. Minneapolis
 O'Brien, W. M. St. Paul
 Ochsner, C. G. Wabasha
 O'Connor, L. J. St. Paul
 Odel, H. M. Rochester
 O'Donnell, D. M. Ortonville
 O'Donnell, J. E. Minneapolis
 Oeljen, S. C. G. Waseca
 Oerting, Harry. St. Paul
 Ogden, Warner. St. Paul
 Ohage, Justus, Jr. St. Paul
 O'Hanlon, J. A. Proctor
 Ohnstad, J. L. McIntosh
 Olds, G. H. Waseca
 Olds, J. W. Rochester
 O'Leary, J. H. Staples
 O'Leary, P. A. Rochester
 Oliver, C. I. Graceville
 Oliver, I. L. Graceville
 Olmanson, E. G. St. Peter
 Olsen, A. M. Rochester
 Olsen, E. G. Minneapolis
 Olson, A. C. Minneapolis
 Olson, A. E. Duluth
 Olson, A. O. Duluth
 Olson, C. A. St. Paul
 Olson, C. J. Belle Plaine
 Olson, D. C. Gaylord
 Olson, E. A. Pine Island
 Olson, F. A. Minneapolis
 Olson, G. E. West Concord
 Olson, O. A. Minneapolis
 Olson, R. G. Minneapolis
 Onsgard, L. K. Houston
 Oppegard, C. L. Crookston
 Oppegard, M. O. Crookston
 Oppen, E. G. Minneapolis
 O'Reilly, B. E. St. Paul
 Ormond, D. T. Waconia
 *Osborn, Lida. Mankato
 Ostergren, E. W. St. Paul
 Otto, H. C. Frazee

Ouellette, A. J.....St. Paul
Owre, Oscar.....Minneapolis

Page, C. V.....St. Paul
Page, R. L.....St. Charles
Paine, J. R.....Minneapolis
Palmer, C. F.....Albert Lea
Palmer, H. A.....Blackduck
Palmer, W. L.....Albert Lea
Pankratz, P. J.....Mountain Lake
Pansch, F. N.....Rochester
Paradis, W. G.....Crookston
Parker, O. W.....Ely
Parker, R. L.....Rochester
Parker, W. H.....Chisholm
Parkhill, Edith M.....Rochester
Parson, E. I.....Askov
Parson, L. R.....Elbow Lake
Parson, Lillian B.....Elbow Lake
Parsons, J. G.....Crookston
Pasek, A. W.....Cloquet
Passer, A. A.....Olivia
Pastore, P. N.....Rochester
Patterson, W. E.....Minneapolis
Patterson, W. L.....Fergus Falls
Pattison, D. H.....Rochester
Patton, G. D.....Pittsburgh, Pa.
*Paulsen, E. L.....Minneapolis
Paulson, E. C.....Dalton
Paulson, D. L.....Rochester
Paulson, J. A.....Rochester
Paulson, T. S.....Fergus Falls
Pearman, R. O.....Rochester
Pearsall, R. P.....Virginia
Pearson, B. F.....Shakopee
Pearson, F. R.....St. Paul
Peck, L. D.....Hastings
Peck, L. R.....Hastings
Pedersen, R. C.....Duluth
Pederson, R. M.....Minneapolis
Pelant, F. J.....New Ulm
Pelletiere, E. V.....Thief River Falls
Pemberton, J. deJ.....Rochester
Penhall, F. W.....Morton
Penn, G. E.....Mankato
Pennie, D. F.....Duluth
Pennington, R. E.....Rochester
Pennington, Reuben.....Minneapolis
Peppard, T. A.....Minneapolis
Perozzi, Thelma.....Santa Barbara, Calif.
Perry, C. G.....St. Paul
Peril, A. L.....Canby
Peters, G. A.....Rochester
Peterson, J. R.....Minneapolis
Peterson, M. C.....Willmar
Peterson, P. C.....Braham
Peterson, Thorvald.....Minneapolis
Peterson, A. A.....Mora
Peterson, D. B.....St. Paul
Peterson, E. N.....Virginia
Peterson, H. O.....Minneapolis
Peterson, H. W.....Minneapolis
Peterson, J. H.....Duluth
Peterson, J. L. E.....St. Paul
Peterson, N. P.....Minneapolis
Peterson, O. H.....Minneapolis
Peterson, O. L.....Cokato
Peterson, P. E.....Minneapolis
Peterson, P. E.....Vesta
Peterson, V. N.....St. Paul
Peterson, W. C.....Minneapolis
Peterson, W. G.....Rochester
Peterson, W. H.....Minneapolis
Petit, L. J.....Minneapolis
Pettraborg, H. T.....Aitkin
Peyton, W. T.....Minneapolis
Pfuetze, K. H.....Nopeming
Plunder, M. C.....Minneapolis
Phalen, G. S.....Rochester
Phelps, K. A.....Minneapolis
Phillips, A. E.....Delano
Phillips, R. B.....Rochester
Phillips, W. H.....Jordan
Pierce, C. H.....Wadena
Piper, M. C.....Rochester
Piper, W. A.....Mountain Lake
Platou, E. S.....Minneapolis
Plimpton, N. C., Jr.....Rochester
Plondke, F. J.....St. Paul
Plonske, C. J.....Faribault
Plowman, E. T.....Marble
Plummer, W. A.....Rochester
Pogue, R. E.....Watertown
Pohl, J. F.....Minneapolis
Poirier, J. A.....Forest Lake
Pollard, D. W.....Minneapolis
Pollock, D. K.....Minneapolis
Pollock, G. A.....Rochester
Pollock, L. W.....Rochester

Polzak, J. A.....Minneapolis
Pool, T. L.....Rochester
Popp, W. C.....Rochester
Poppe, F. H.....Minneapolis
Potek, David.....International Falls
Potthoff, C. J.....Minneapolis
Power, J. E.....Duluth
Powers, F. H.....Rochester
Prangen, A. D.....Rochester
Pratt, F. J.....Minneapolis
Pratt, J. A.....Minneapolis
Preine, I. A.....Minneapolis
Preisinger, J. W.....Renville
Prendergast, H. J.....St. Paul
Prendergast, J. J.....St. Paul
Prickman, L. E.....Rochester
Priestley, J. T.....Rochester
Prim, J. A.....Minneapolis
Prins, L. R.....Albert Lea
Proeschel, R. K.....Willmar
Proshek, C. E.....Minneapolis
Prunty, F. C.....Rochester
Pugh, D. G.....Rochester
Purves, G. H.....Lake Benton
Puumala, R. H.....Cloquet

Quanstrom, V. E.....Brainerd
Quello, R. O. B.....Minneapolis
Quill, T. H.....Rochester
Quinby, T. F.....Lake Wales, Fla.
Quist, H. W.....Minneapolis

Raadquist, C. S.....Hibbing
Radabaugh, R. C.....Hastings
Raetz, S. J.....Maple Lake
Raihala, John.....Virginia
Raiter, F. W. S.....Cloquet
Raiter, R. F.....Cloquet
Ralph, R. D.....Rochester
Ramsey, W. R.....St. Paul
Randall, A. M.....Ashby
Randall, K. C., II.....Rochester
Randall, L. M.....Rochester
Ransom, M. L.....Hancock
Rasmussen, R. C.....Minneapolis
Rasmussen, T. B.....Montreal, Can.
Rasmussen, W. C.....Rochester
Raszkowski, H. J.....Rochester
Ratcliffe, J. J.....Aitkin
Rathbun, C. A.....St. Cloud
Raymond, J. H.....Triumph
Rea, C. E.....Minneapolis
Reed, C. A.....Minneapolis
Reeser, Richard, Jr.....Rochester
Reeve, E. A. T.....Elbow Lake
Redding, M. D.....Rochester
Reff, A. R.....Crookston
Regnier, E. A.....Minneapolis
Rein, G. N.....Rochester
Reineke, G. F.....New Ulm
Reiter, H. W.....Shakopee
Replogle, W. H.....Wabasha
Rewbridge, A. G.....Minneapolis
Reynolds, J. S.....Minneapolis
Rice, C. O.....Minneapolis
Rice, H. G.....Moorhead
Richards, E. T. F.....St. Paul
Richards, W. B.....St. Cloud
Richardson, F. S.....Minneapolis
Richardson, H. E.....St. Paul
Richardson, R. J.....Rushford
Richardson, W. E.....Rushford
Richdori, L. F.....Minneapolis
Rick, P. F. W.....St. Paul
Ridgway, A. M.....Annandale
Rieke, W. W.....Wayzata
Rigler, L. G.....Minneapolis
Rimer, E. W.....Breckenridge
Ringle, O. F.....Walker
Ripple, R. J.....New London
Risch, R. E.....Minneapolis
Rishmiller, J. H.....Minneapolis
Risser, A. F.....Stewartville
Risser, E. D.....Winona
Ritchie, H. P.....St. Paul
Ritchie, W. P.....St. Paul
Ritt, A. E.....St. Paul
Rivers, A. B.....Rochester
Rizer, R. I.....Minneapolis
Roan, C. M.....Minneapolis
Robb, E. F.....Minneapolis
Robbins, C. P.....Winona
Robbins, O. F.....Minneapolis
Roberts, L. M.....Little Falls
Roberts, O. W.....Owatonna
Roberts, T. S.....Minneapolis
Roberts, W. B.....Minneapolis
Robertson, F. O.....East Grand Forks
Robertson, H. E.....Rochester
Robertson, J. B.....Minneapolis
Robertson, P. A.....Austin

Robilliard, C. M.....Faribault
Robinson, F. J.....Rochester
Robinson, J. M.....Duluth
Robitshek, E. C.....Minneapolis
Rochford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Roehlke, A. B.....Elk River
Roemer, H. J.....Winona
Rogers, C. W.....Heron Lake
Rogers, S. F.....St. Paul
Rogne, W. G.....Spring Grove
Roholt, C. L.....Waverly
Rohrer, C. A.....Waterville
Rokala, H. E.....Biwabik
Rolid, D. H.....Howard Lake
Rood, D. C.....Duluth
Rose, J. T.....Lakefield
Rosen, Samuel.....Minneapolis
Rosenberg, E. F.....Rochester
Rosenblatt, Louis.....St. Paul
Rosenfield, A. B.....Hibbing
Rosenholtz, B. I.....St. Paul
Rosenow, E. C.....Rochester
Rosenow, E. C., Jr.....Rochester
Rosenstiel, H. C.....Rochester
Rosenthal, Robert.....St. Paul
Rosenwald, R. M.....Minneapolis
Roskilly, G. C. P.....Minneapolis
Ross, A. J.....Minneapolis
Rossen, R. X.....Hastings
Roth, F. D.....Lewiston
*Rothenburg, J. C.....Springfield
Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
*Rousseau, Victor.....Maple Lake
Roust, H. A.....Montevideo
Rowe, O. W.....Duluth
Rowe, W. H.....Fairmont
Rowles, E. K.....Coleraine
Roy, J. A.....Red Lake Falls
Roy, P. C.....St. Paul
Rucker, C. W.....Rochester
Rucker, W. H.....Minneapolis
Rud, N. E.....Minneapolis
Rudell, G. L.....Minneapolis
Rudie, P. S.....Duluth
Ruggles, G. McC.....Forest Lake
Rubberg, W. C.....St. Paul
Rumpf, C. W.....Faribault
Rumpf, W. H., Jr.....St. Cloud
Rumpf, W. H.....Faribault
Rushton, J. G.....Rochester
Russ, H. H.....Blue Earth
Russeth, A. N.....Minneapolis
Rusten, E. M.....Minneapolis
Rutherford, W. C.....St. Paul
Rutledge, D. I.....Rochester
Rutledge, L. H.....Detroit Lakes
Ryan, J. J.....St. Paul
Ryan, J. M.....St. Paul
Ryan, M. E.....St. Paul
Ryan, W. J.....Duluth
Ryearson, E. H.....Rochester

Sach-Rowitz, Alvan.....Moose Lake
Sadler, W. P., Jr.....Minneapolis
Saffert, C. A.....New Ulm
Sahr, W. G.....Hutchinson
St. Cyr, K. J.....Osseo
Salt, C. G.....Minneapolis
Salter, R. A.....Virginia
Samson, E. R.....Stillwater
Samuelson, L. G.....Mankato
Samuelson, Samuel.....Minneapolis
Sanderson, A. G.....Granite Falls
Sandt, K. E.....Minneapolis
Sandven, N. O.....Paynesville
Sanford, A. H.....Rochester
Sarrif, O. E.....Virginia
Sarnecki, M. M.....St. Paul
Satersmoen, Theodore.....Pelican Rapids
Sather, Allen.....Fosston
Sather, E. R.....Alexandria
Sather, G. A.....Fosston
Sather, R. O.....Crookston
Satterlee, H. W.....Lewiston
Satterlund, V. L.....St. Paul
Savage, F. J.....St. Paul
Sawatzky, W. A.....Minneapolis
Sax, S. G.....Duluth
Schaafl, F. H. K.....Minneapolis
Schade, F. L.....Worthington
Schaefer, J. F.....Owatonna
Schaefer, Samuel.....Winona
Schaefer, W. G.....Minneapolis
Schamber, W. F.....Parkers Prairie
Schatz, F. J.....St. Cloud
Scheifley, C. H.....Rochester
Schedrup, N. H.....Minneapolis
Scherer, C. A.....Duluth
Scherer, L. R.....Minneapolis

*Deceased

Schiele, B. C. Minneapolis
 Schimelpfenig, G. T. Chaska
 Schleinitz, F. B. Battle Lake
 Schlesselman, G. H. Anoka
 Schlesselman, J. T. Mankato
 Schlicke, C. P. Rochester
 Schmidt, G. F. Minneapolis
 Schmidt, H. W. Rochester
 Schmidt, P. A. Good Thunder
 Schmidt, P. G., Jr. Granite Falls
 Schmidt, W. R. Worthington
 Schmitt, A. F. Minneapolis
 Schmitt, G. F., Jr. Rochester
 Schmitt, S. C. Los Angeles, Calif.
 Schneider, H. H. Rochester
 Schneider, J. P. Minneapolis
 Schneider, P. J. Adams
 Schneidman, N. R. Minneapolis
 Schoch, R. B. J. St. Paul
 Scholpp, O. W. Hutchinson
 Schons, Edward St. Paul
 Schottler, G. J. Dexter
 Schottler, M. E. Minneapolis
 Schroder, C. H. Duluth
 Schroepfel, J. E. Winthrop
 Schuldt, F. C. St. Paul
 Schulte, T. L. Rochester
 Schultz, J. A. Albert Lea
 Schultz, P. J. Minneapolis
 Schulze, A. G. St. Paul
 Schunke, G. B. Rochester
 Schussler, O. F. Minneapolis
 Schutz, E. S. Mountain Lake
 Schwartz, E. R. Stewartville
 Schwartz, V. J. Minneapolis
 Schweiger, L. R. Rochester
 Schweiger, T. R. Hibbing
 Schwyzer, Arnold St. Paul
 Schwyzer, Gustav Minneapolis
 Scofield, C. L. Benson
 Scott, E. E. St. Paul
 Scott, F. H. Minneapolis
 Scott, H. G. Minneapolis
 Sealy, W. B. Rochester
 Seashore, Gilbert Minneapolis
 Seashore, R. T. Duluth
 Seedorf, E. E. Rochester
 Seely, I. F. Northfield
 Seham, Max Minneapolis
 Seifert, M. H. Excelsior
 Seifert, O. J. New Ulm
 Seitz, S. B. Barnesville
 Seldon, T. H. Rochester
 Seljeskog, S. R. Minneapolis
 Sellsesh, I. F. Minneapolis
 Senkler, G. E. St. Paul
 Senn, E. W. Owatonna
 Serkland, J. C. Rothsay
 Sessions, J. C. Minneapolis
 Sether, A. F. Ruthon
 Settlage, A. F. E. Worthington
 Setzer, H. J. St. Paul
 Shaleen, A. W. Hallock
 Shaperman, Eva P. Minneapolis
 Shapiro, E. Z. Duluth
 Shapiro, M. J. Minneapolis
 Sharp, D. V. Minneapolis
 Sharpe, W. S. Rochester
 Shastid, T. H. Duluth
 Shaw, A. W. Virginia
 Shedlov, Abraham Fosston
 Sheedy, C. L. Austin
 Shelden, W. D. Rochester
 Sheldon, C. H. Rochester
 Shellman, J. L. St. Paul
 Shephard, V. D. Rochester
 Sheppard, C. G. Hutchinson
 Sheppard, P. E. Hutchinson
 Sher, D. A. Austin
 Sherman, C. H. Bayport
 Sherman, C. L. Luverne
 Sherwood, G. E. Kimball
 Shillington, M. A. Glendive, Mont.
 Shimonek, S. W. St. Paul
 Short, Jacob St. Paul
 Shrader, J. S. Marietta
 Siegel, J. S. Virginia
 Siegmann, W. C. Minneapolis
 Silver, J. D. Minneapolis
 Simson, Carl Barnesville
 Simson, C. W. Hawley
 Simons, B. H. Chaska
 Simons, E. J. Swanville
 Simons, J. H. Minneapolis
 Simons, L. T. St. Paul
 Simons, S. J. Akeley
 Simonson, D. B. Minneapolis
 Simonton, K. M. Rochester
 Simpson, E. D. Minneapolis

Sinamark, Andrew Hibbing
 Singer, B. J. St. Paul
 Siperstein, D. M. Minneapolis
 Sisler, C. E. Grand Rapids
 Sivertsen, Andrew Mound
 Sivertsen, Ivar Minneapolis
 Sjostrom, L. E. Storden
 Skaug, H. M. Chatfield
 Skinner, H. O. St. Paul
 Skjold, A. C. Minneapolis
 Slater, S. A. Worthington
 Sloan, Julius Minneapolis
 Slocumb, C. H. Rochester
 Slocumb, J. A. Plainview
 Slyfield, F. F. Duluth
 Smisek, E. A. St. Paul
 Smisek, F. M. E. Minneapolis
 Smith, A. E. Minneapolis
 Smith, Archie M. Minneapolis
 Smith, A. M. Minneapolis
 Smith, B. A. Crosby
 Smith, B. F. Rochester
 Smith, C. M. Duluth
 Smith, F. A. Rochester
 Smith, F. D. Rochester
 Smith, F. L. Rochester
 Smith, G. G. Fulda
 Smith, H. L. Rochester
 Smith, H. R. Minneapolis
 Smith, K. A. Rochester
 Smith, L. A. Balaton
 Smith, L. A. Rochester
 Smith, L. G. Montevideo
 Smith, M. W. Red Wing
 Smith, N. D. Rochester
 Smith, N. M. Minneapolis
 Smith, R. L., Jr. Rochester
 Smith, S. J. Eveleth
 Smith, V. D. E. St. Paul
 Smith, W. R. Grand Marais
 Snell, A. M. Rochester
 Snyder, G. W. St. Paul
 Snyder, J. M. Rochester
 Snyder, O. E. Ely
 Soderlind, R. T. Minneapolis
 Sogge, L. L. Windom
 Sohlberg, O. L. St. Paul
 Sohm, A. E. Mankato
 Solhaug, S. B. Minneapolis
 Sommer, A. W. Elmore
 Soniat, T. L. L. Rochester
 Sonnesyn, N. N. Le Sueur
 Sorum, F. T. Jasper
 Souster, B. B. St. Paul
 Spang, A. J. Duluth
 Spano, J. P. Minneapolis
 Sperling, Louis Minneapolis
 Spicer, F. W. Minneapolis
 Spittler, R. O. Waseca
 Sprafka, J. M. St. Paul
 Sprague, R. G. Rochester
 Spratt, C. N. Minneapolis
 Spurbeck, R. G. Cloquet
 Spurzem, R. J. Anoka
 Squire, E. W. Rochester
 Stafford, C. E. Hewitt
 Stafford, D. E. Rochester
 Staife, W. A. Moorhead
 Stalker, L. K. Rochester
 Stanford, C. E. Minneapolis
 *Stangl, F. H. St. Cloud
 Stangl, P. E. St. Cloud
 Stanley, C. R. Worthington
 Stebbins, T. L. Minneapolis
 Steffens, L. A. Red Wing
 Stein, R. J. Pierz
 Steinberg, C. L. St. Paul
 Steiner, I. W. Winona
 Stelter, L. A. Minneapolis
 Stelmus, H. L. Parkers Prairie
 Stenstrom, Annette E. T. Minneapolis
 Stephan, E. L. Hinckley
 Sterner, E. G. St. Paul
 Sterner, E. R. St. Paul
 Steube, R. W. St. Paul
 Stevens, John Gouville
 Stevenson, B. M. Fulda
 Stewart, Alexander St. Paul
 Stewart, A. B. Owatonna
 Stewart, C. A. Minneapolis
 Stewart, E. W. Grand Rapids
 Stewart, N. E. St. Cloud
 Stewart, R. I. Minneapolis
 Stickney, J. M. Rochester
 Stillwell, W. C. Mankato
 Sinner, S. E. St. Paul
 Stocking, F. F. Hallock
 Stockmann, A. E. St. Paul
 Stoesser, A. V. Minneapolis
 Stolpestad, A. H. St. Paul

Stolpestad, H. L. St. Paul
 Stomel, Joseph Los Angeles, Calif.
 Strachauer, A. C. Minneapolis
 Strand, E. V. Bayport
 Stransky, T. W. Owatonna
 Strate, G. E. St. Paul
 Strathern, C. S. St. Peter
 Strathern, F. P. St. Peter
 Strathern, M. L. Gilbert
 Stratte, A. K. Pine City
 Stratte, H. C. Windom
 Straus, M. L. St. Paul
 Street, Bernard St. Cloud
 Strobel, W. G. Duluth
 Stroebel, C. F., Jr. Northfield
 Stromgren, D. T. Minneapolis
 *Strout, E. S. Minneapolis
 Strout, G. E. Minneapolis
 Stuart, A. B. Cloquet
 Stuhler, L. G. Rochester
 Stuhr, J. W. Stillwater
 Sturte, J. R. Minneapolis
 Stuurmans, S. H. Erskine
 Sukeforth, L. A. Duluth
 Sullivan, R. M. Minneapolis
 Sullivan, R. R. Minneapolis
 Sundt, Mathias Minneapolis
 Sutherland, C. G. Rochester
 Sutherland, H. N. Ely
 Sutton, C. S. St. Cloud
 Sutton, H. R. Hoffman
 Swanson, Cephas Minneapolis
 Swanson, J. A. St. Paul
 Swanson, P. E. Virginia
 Swanson, R. E. Minneapolis
 Swanson, R. R. Albert Lea
 Swartz, F. C. Rochester
 Swedburg, W. A. Duluth
 Swedenburg, P. A. Swanville
 Sweetser, H. B., Jr. Minneapolis
 Sweetser, H. B., Sr. Minneapolis
 Sweetser, T. H. Minneapolis
 Sweitzer, S. E. Minneapolis
 Swendsen, C. G. Minneapolis
 Swenson, J. J. St. Paul
 Swensen, R. G. North Branch
 Swenson, A. O. Duluth
 Swenson, O. J. Waseca
 Swezey, B. F. Bellingham
 Swingle, H. F. Rochester
 Sybilrud, H. W. Briceyn

Tangen, G. M. Canby
 Tanglin, W. G. L. Mahomed
 Tanquist, E. J. Alexandria
 Taylor, C. W. Duluth
 Taylor, J. H. Minneapolis
 Teisberg, C. B. St. Paul
 Telford, V. J. Litchfield
 Tenner, R. J. Rochester
 Tennison, W. J. Rochester
 Terrell, B. J. Nopeming
 Tesch, G. H. Elk River
 Thabes, J. A. Brainerd
 Thabes, J. A., Jr. Brainerd
 Thayer, E. A. Truman
 Thielen, R. D. St. Michael
 Thigpen, F. M. Rochester
 Thomas, G. E. Minneapolis
 Thomas, G. H. Minneapolis
 Thomas, G. J. Minneapolis
 Thompson, Albert St. James
 Thompson, Arthur Kokato
 Thompson, F. A. St. Paul
 Thompson, G. J. Rochester
 Thomson, J. M. Brownsdale
 *Thordarson, Theodore Minneota
 Thoreson, M. O. South St. Paul
 Thorson, E. O. Luverne
 Thorson, O. P. Northfield
 Thyssell, D. M. Minneapolis
 Thyssell, F. A. Moorhead
 Thyssell, V. D. Hawley
 Tibbetts, M. H. Duluth
 Tierney, C. M. Harmony
 Tift, C. R. St. Paul
 Tildquist, D. L. Duluth
 Tillisch, J. H. Rochester
 Tinker, C. W. Stewart
 Tingdale, A. C. Minneapolis
 Tingdale, Carlyle Hibbing
 Fischer, E. P. Rochester
 Tofte, Josephine B. Minneapolis
 Tooke, T. B., Jr. Rochester
 Torgerson, W. B. Oklee
 Townsend, De Wayne Broton
 Traeger, C. A. Faribault
 Trandem, C. Elinor Rochester
 Traxler, F. J. Henderson
 Tregilas, H. R. So. St. Paul
 Trommald, Gladys B. K. Brainerd

*Deceased

Troost, H. B.....Mankato
 Trueman, H. S.....Minneapolis
 Trutna, T. J.....Silver Lake
 Trytten, E. G.....Coleraine
 Tunstead, H. J.....Minneapolis
 Tuohy, E. B.....Rochester
 Tuohy, E. L.....Duluth
 Turnacliff, D. D.....Minneapolis
 Tweedy, G. J.....Winona
 Tweedy, J. A.....Winona
 Tweedy, R. B.....Winona
 Twyman, R. A.....Rochester
 Tyrrell, C. C.....Minneapolis

Ude, W. H.....Minneapolis
 Uhley, C. G.....Crookston
 Uihlein, Alfred.....Rochester
 Ulrich, H. L.....Minneapolis
 Undine, C. A.....Minneapolis
 Urberg, S. E.....Duluth
 Usher, F. C.....Rochester

Vaaler, Torvald.....Cannon Falls
 Vadheim, A. L.....Tyler
 Vadheim, J. L.....Rochester
 Vail, J. B.....Henning
 Valentine, W. H.....Tracy
 Vandersluis, C. W.....Bemidji
 Van Slyke, C. A.....St. Paul
 Van Valkenberg, J. D.....Floodwood
 Vaughan, V. M.....Truman
 Vaughn, L. D.....Rochester
 Veirs, D. M.....St. Paul
 Veirs, Ruby J. S.....St. Paul
 Venables, A. E.....St. Paul
 Vercellini, C. H. E.....Duluth
 Vezina, J. C.....Mapleton
 Vickers, P. M.....Rochester
 Vik, A. E.....Minneapolis
 Vik, Melvin.....Onamia
 Virnig, M. P.....Wells
 Vogel, H. A. L.....New Ulm
 Vogel, J. H.....New Ulm
 Von der Weyer, W. H.....St. Paul

Waas, C. W.....St. Paul
 Wadd, C. T.....Waseca
 Wagener, H. P.....Rochester
 Waggoner, R. P.....Rochester
 Wahlberg, E. W.....Sleepy Eye
 Wahlquist, H. F.....Minneapolis
 Waisman, Morris.....Rochester
 Wakefield, E. G.....Rochester
 Walch, A. E.....Minneapolis
 Waldron, C. W.....Minneapolis
 Walfred, K. A.....St. Cloud
 Walker, A. E.....Duluth
 Walker, A. E.....St. Paul
 Walker, G. H.....Winona
 Wall, C. R.....Minneapolis
 Wallace, M. O.....Duluth
 Waller, J. D.....Wilmont
 Walsh, J. J.....Rochester
 Walsh, M. N.....Rochester
 Walter, C. W.....St. Paul
 Walters, Waltman.....Rochester
 Wangenstein, O. H.....Minneapolis
 Wanous, E. Z.....Minneapolis
 Ward, A. W.....Minneapolis
 Ward, P. A.....Minneapolis
 Warham, T. T.....Minneapolis
 Warnock, R. W.....St. Paul
 Warren, C. A.....St. Paul
 Warren, E. L.....St. Paul

Warren, F. S.....Washington, D. C.
 Warner, J. J.....Perham
 Wasson, L. F.....Alexandria
 Watkins, C. H.....Rochester
 Watson, A. M.....Royalton
 Watson, B. A.....Minneapolis
 Watson, C. G.....Soudan
 Watson, C. J.....Minneapolis
 *Watson, J. A.....Minneapolis
 Watson, P. T.....Cass Lake
 Watson, W. J.....Holdingford
 Watz, C. E.....St. Paul
 Waugh, J. M.....Rochester
 Weaver, P. H.....Faribault
 Webb, R. C.....Minneapolis
 Webber, E. E.....Duluth
 Webber, F. L.....St. Paul
 Weber, H. M.....Rochester
 Webster, L. J.....Battle Lake
 Weed, V. A.....Red Lake Falls
 Weir, J. F.....Rochester
 Weisberg, Maurice.....St. Paul
 Weiser, G. B.....New Ulm
 Weisman, S. A.....Minneapolis
 Weismann, R. E.....Rochester
 Welch, M. C.....St. Paul
 Wellman, T. G.....Virginia
 Wells, A. H.....Duluth
 Wells, W. B.....Jackson
 Welton, P. C.....Nopeming
 Wenner, W. T.....St. Cloud
 Wentworth, A. J.....Mankato
 Wenzel, G. P.....St. Paul
 Werner, O. S.....Cambridge
 West, E. J.....Faribault
 Westby, Magnus.....Madison
 Westby, Nels.....Madison
 Westerman, A. E.....Montgomery
 Westerman, F. C.....Montgomery
 Westrup, J. E.....Rochester
 Wethall, A. G.....Minneapolis
 Wetherby, Macnider.....Minneapolis
 Weum, T. W.....Minneapolis
 Wheeler, D. W.....Duluth
 Wheeler, M. W.....St. Paul
 Whetstone, S. D.....Winona
 Whitacre, J. C.....St. Paul
 White, A. A.....Minneapolis
 White, S. M.....Minneapolis
 White, W. D.....Minneapolis
 Whitesell, L. A.....Minneapolis
 Whitmore, F. W.....St. Paul
 Whittemore, D. D.....Bemidji
 Widen, W. F.....Minneapolis
 Wiechman, F. H.....Montgomery
 Wiig, L. M.....Naperville, Ill.
 Wilcox, A. E.....Minneapolis
 Wilcox, L. E.....Rochester
 Wildebush, F. F.....Minneapolis
 Wilder, K. W.....Minneapolis
 Wilder, R. L.....Minneapolis
 Wilder, R. M.....Rochester
 Wilken, P. A.....Minneapolis
 Wilkinson, Stella L.....Newport
 Wilkowske, R. J.....Owatonna
 Will, C. B.....Bertha
 Will, W. W.....Bertha
 Willcutt, C. E.....Minneapolis
 Williams, A. B.....St. Paul
 Williams, C. A.....Pipestone
 Williams, C. K.....St. Paul
 Williams, H. L., Jr.....Rochester
 Williams, H. O.....Lake Crystal
 Williams, J. A.....Slayton
 Williams, L. A.....Slayton
 Williams, M. R.....Cannon Falls
 Williams, R. V.....Rushford

Williams, Robert.....Minneapolis
 Williamson, G. A.....St. Paul
 Willius, F. A.....Rochester
 Willson, D. M.....Rochester
 Wilmot, C. A.....Litchfield
 Wilmot, H. E.....Litchfield
 Wilson, C. E.....Blue Earth
 Wilson, I. H.....Worthington
 Wilson, J. A.....St. Paul
 Wilson, J. V.....St. Paul
 Wilson, L. B.....Rochester
 Wilson, R. B.....Rochester
 Wilson, R. H.....Winona
 Wilson, V. O.....Minneapolis
 Wilson, W. E.....Northfield
 Wilson, W. F.....Lake City
 Wilson, W. H.....Rochester
 Winer, L. H.....Minneapolis
 Wingquist, C. G.....Crosby
 Winnick, J. B.....St. Paul
 Winter, J. A.....Duluth
 Winther, Nora M. C.....Minneapolis
 Wiperman, F. F.....Minneapolis
 Witham, C. A.....Minneapolis
 Withrow, M. E.....International Falls
 Wittich, F. W.....Minneapolis
 Wohlrabe, A. A.....Minneapolis
 Wohlrabe, C. F.....Nicollet
 Wohlrabe, E. J.....Springfield
 Wold, K. C.....St. Paul
 Wolfe, H. H.....St. Paul
 Wolff, H. J.....St. Paul
 Wolkoff, H. J.....St. Paul
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GASTROSCOPIC OBSERVATIONS IN PERNICIOUS ANEMIA*

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THE flexible gastroscope (Schindler) offers an additional means of examination of the gastric mucosa in pernicious anemia. Early histologic studies of the postmortem gastric mucosa have long since established the fact that gastritis with atrophy is the constant finding. The very earliest examinations, of Hunter and others, were open to the objection that postmortem changes were not inhibited, but when Faber¹ and Bloch (1898) adopted the suggestion of Damaschino (1880) and Chauffard (1882) of formalizing the stomach and peritoneal cavities immediately after death, thus fixing the delicate tissues before change could occur, these objections were no longer valid. Meulengracht³ has more recently substantiated these findings, again on postmortem material.

Studies on functional activity have been made, particularly with respect to the inability of the atrophic mucosa in pernicious anemia patients to form hydrochloric acid. Since the use of histamine as a stimulant, this work has become standardized and tends to show that achlorhydria is a constant finding, not favorably influenced by therapy. Castle and others, following up the hypothesis that there is an intrinsic element of, or elaborated by, the gastric mucosa, necessarily present as a component of the complex of factors protective against the occurrence of pernicious anemia, have demonstrated that such a factor does not return to the organism in response to liver therapy. The relationship of this factor to the achlorhydria or the atrophic condition of

the mucosa is as yet not clearly defined. Meulengracht³ and Morrison⁴ have advanced theories, yet awaiting final proof.

By this time many cases of pernicious anemia have been examined gastroscopically, and the presence, always, of an atrophy of greater or less degree has been noted. Whether this condition is amenable to change by adequate liver therapy has been discussed, and favorable and unfavorable results have been recorded. The earliest report was that of Benedict et al² in 1935, but the cases upon which they based their conclusions were, perhaps, not just the sort of cases in which such conclusions would be warranted. Of five patients reported, three had polypi and two had carcinoma of the stomach. Two of those with polypi as well as the two with carcinoma were operated upon. Two of these operations were done before gastroscopic observations were made, and there is nothing in the record to show what therapy, if any, was instituted after operation. Bleeding was undoubtedly a factor in most of the cases. The association of polypi with atrophic gastric mucosa and anemia, or the association of carcinoma with a macrocytic type of anemia and atrophy of the gastric mucosa is not uncommon.

Schindler⁵ has more recently reported that he has seen the return to a normal condition of the gastric mucosa of some pernicious anemia patients who had shown atrophy of mucosa on original examination, following adequate liver therapy. His report includes four patients with pernicious anemia in whom he saw normal mucosa after treatment, although he had not examined them before treatment, and three patients observed before and after treatment, in one of whom

*From the Gastroscopy Clinic, Dispensary, Medical School, University of Minnesota, and the Medical Division, The Nicollet Clinic, Minneapolis, Minnesota. Read before the Minnesota Society of Internal Medicine, November 28, 1939, St. Paul, Minnesota.

the mucosa became normal, the other two still showing some atrophy, although not as extensive as at the original examination.

I have so far (750 examinations) not seen an indubitable case of pernicious anemia with a normal gastric mucosa. Moreover, I have not seen restoration to normal condition of gastric mucosa occur in any of the cases reexamined after treatment, although in some cases some evidence of regeneration was present. Fifteen patients who had been diagnosed unmistakably pernicious anemia by all the usual and accepted criteria were chosen. Six reexamined showed still very definite atrophic mucosa, although in two there was some improvement in that what were thought to be areas of regeneration were present. One was definitely worse, *i.e.*, the atrophy was more extensive. One had had inadequate treatment. One of the fifteen was examined for the first time when her blood was normal, having received liver extract for four years, but who had persistent gastric complaints; an actively inflammatory atrophic condition was seen. One of the fifteen had died, from what cause I do not know. Five of the fifteen did not respond to our request that they return for reexamination, and two of the fifteen who did come in could not be reexamined because of acute upper respiratory infection and have not been seen since. Another patient with marked mental changes was not reexamined and in another, because of complication of paralysis agitans, the examination was too difficult the first time to warrant repetition.

SUMMARY OF CASES

Number examined.....	15
Number re-examined.....	6
Worse—1	
Improved—2	
Unchanged—3	
Dead	1
Failed to return.....	5
Reexamination impossible.....	3

Case 1.—2-24-37 Atrophy. Hemoglobin 38, red blood cells 1,700,000. 7-7-37 no change. Hemoglobin 82, red blood cells 4,880,000. Therapy adequate.

Case 2.—3-3-37 Atrophy. Hemoglobin 56, red blood cells 2,480,000. 5-10-39 atrophy, slight effort of regeneration. Hemoglobin 88. Therapy adequate.

Case 3.—5-4-38 Atrophy. Hemoglobin 83, red blood cells 3,700,000. 6-15-39 no change. 5-27-38 hemoglobin 77, red blood cells 7,960,000. Therapy adequate.

Case 4.—1-18-36 Atrophy. Hemoglobin 52, red blood cells 2,980,000. 6-22-39 atrophy more marked. Hemo-

globin 97. Therapy probably not quite adequate in this case, as general condition was not very good.

Case 5.—5-1-36 Atrophy. Hemoglobin 70, red blood cells 3,860,000. 4-26-39 no change. Hemoglobin 64, red blood cells 3,080,000. Still some symptoms. Inadequate therapy.

Case 6.—2-3-37 Atrophy. Hemoglobin 53, red blood cells 2,260,000. 4-5-39 atrophy and areas of superficial gastritis. Hemoglobin 85, red blood cells 4,760,000. Considered adequately controlled.

Case 7.—9-14-38 Atrophy with inflammatory change. Hemoglobin 93. Not examined again. Patient considered to have been adequately controlled for four years.

Case 8.—4-13-38 Diffuse atrophy. Single polyp of anterior wall of stomach. Not reexamined because of paralysis agitans and diabetes.

Case 9.—9-21-38 Diffuse atrophy. Hemoglobin 50. 9-14-38 hemoglobin 35, red blood cells 2,040,000. Has had some liver but obviously inadequate amount.

Case 10.—5-27-36 Atrophy. Hemoglobin 42, red blood cells 2,350,000. Untreated. Patient died in 1938. Cause unknown.

Case 11.—11-4-36 Atrophy. Hemoglobin 76, red blood cells 3,220,000. Untreated.

Case 12.—11-25-36 Atrophy. Hemoglobin 41, red blood cells 1,900,000. Untreated.

Case 13.—12-2-36 Atrophy. Hemoglobin 40, red blood cells 1,500,000. Untreated. Returned 1939 but could not be reexamined because of acute upper respiratory infection.

Case 14.—2-3-27 Atrophy. Hemoglobin 38, red blood cells 1,180,000. Untreated.

Case 15.—2-7-37 Atrophy. Hemoglobin 54, red blood cells 1,680,000. Untreated. Not reexamined 1939 because of marked mental changes and lack of cooperation consequent thereon.

The reversion to a normal condition of the gastric mucosa in pernicious anemia patients treated with liver would be contrary to the pathologic and histologic studies of Meulengracht³ and Faber.¹ Both of these authors have examined post-mortem material from pernicious anemia patients adequately controlled as to anemia and dying from intercurrent causes, and have always found an atrophic condition of the mucosa with gastritis. Changed conditions of general nutrition and blood elements brought about by liver therapy in pernicious anemia might conceivably result in some improvement in gross appearance of gastric mucosa, as to color and even in the direction of recession of atrophic appearance. But, in any condition of gastritis, the replacement of diseased gastric cells is by non-specific, simple, columnar epithelium and not by functional cells capable of secreting any of the supposed specific substances; and at times the regenerated mucosa has the characteristics of intestinal mucosa. This

is also in line with the other experimental evidence, namely, the hydrochloric acid does not return to the gastric secretion in pernicious anemia in spontaneous or induced remission, nor does the so-called intrinsic factor. Once an atrophic condition of the tongue has been established, a restitution to normal appearance does not occur during either spontaneous or induced remission. If liver therapy actually restored the gastric mucosa to normal and if the gastric mucosal cells thus regenerated were capable of acting as the normal glands should, then, not only hydrochloric acid, but also intrinsic factor should return to the economy of the organism, and the blood could be maintained in a normal condition without the further aid of liver—in other words the patient would be actually cured of his pernicious anemia.

This happy result has, so far, not been accomplished. Therefore, even if there is an apparent improvement in the atrophic condition of the gastric mucosa as seen gastroscopically in pernicious anemia patients as the result of liver therapy, such improvement would probably be because of replacement of atrophied mucosal elements by other new epithelium, probably of simple columnar type, sufficient to cover over the submucosa, hide the blood vessels and give the appearance of a normal gastric mucosa. Based upon the healing effects seen in other conditions, it is not likely that these replacement cells would be capable of performing the specific functions of the original, normal mucosa, and hence the lack of intrinsic factor, hydrochloric acid and other perhaps now unknown effective elements for anti-pernicious

anemia influence would still be lacking. The patient would still have pernicious anemia.

Until satisfactory histologic studies of the gastric mucosa of patients well controlled as to the pernicious anemia state, dying of some unrelated circumstance, have been made, conclusions based upon observations of gross conditions observed gastroscopically may not safely be extended beyond the point of description.

Supplementing the body's economy with what seems to be obviously lacking, seems to arrest the progress of the disease and to restore to apparent normal the hemologic elements; but the disease itself persists. As soon as liver is withdrawn from any individual, he more or less promptly relapses; the fundamental factors have been prevented from operating, but their existence has not been abolished. The gastric mucosa may be, by improving the blood and general nutrition of the pernicious anemia patient, apparently or actually regenerated, by some sort of reparative cells, from its atrophic state, but it is unlikely that the disease "pernicious anemia" is thereby permanently influenced.

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A PROPER AND ADEQUATE PROTEIN DIET FOR ELDERLY PEOPLE*

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WE ARE becoming a nation of elderly people. This is modifying our practice to a degree that few appreciate. I ask a lenient attitude on your part and the privilege to indulge in some repetition. A year ago I spoke before this Society concerning the overriding of food and vitamin deficiencies, and reported upon the therapeutic potentialities of thiamin chloride. I demonstrated an instance of extreme gastric

atony and stasis in a man with tabes and diabetes where parenteral thiamin chloride promptly restored gastric tonus and emptying time. I have since encountered an extreme megacolon in an instance of alcoholic polyneuritis. This colon came back to normal size and function, but only after much more prolonged restoration of adequate diet and with thiamin chloride fortification. This type of atony is comparable to that occurring to the heart in beri-beri.

Many articles dealing with vitamins and nu-

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trition continue to appear. Vitamin concentrate manufacturers continue their vivid and eager display through every advertising medium. The good, the dubious, and the bad get equal emphasis. We are, indeed, in the midst of much propaganda but it must be granted whereas it is usually an evil agent, there must be something said for publicizing certain principles that, like "faith, hope, and charity," are inherently good. So it is with the material food supplies which provide human sustenance. Indeed, it is to secure an abundance thereof that we see developed the most debasing and disastrous of all propaganda—both economic and military. It is timely, therefore, not only to attempt to keep step in utilizing the specific products (vitamin concentrates and synthetics) but to scan the broader generalities uncovered by studies in food deficiencies that we may more sensibly adjudge man's needs at various ages or in certain environments. This simply means an attempt to outline for humans a "balanced ration" comparable to that which agronomists and schools of agriculture have effectively and scientifically devised for domestic animals.

Since the very expression "domestic animals" connotes their utilization for burdensome work and as sources of human food it should be unnecessary to reiterate that man came out of caves and developed modern contrasting rural and urban living, through animal husbandry. Considering the long mutual interdependence existing between man and domestic animals—horses, hogs, goats, cattle, sheep, and chickens—I wish to stress only the enormous contribution of animals to man through acting as concentrators of forage and materials too unwieldy for him to utilize. The almost overwhelming corn crop of our Middle West is marketed neither in sacks nor in jugs although garden portions reach our tables or our bars in those forms. The great bulk of our corn is sold in the form of beef and pork products. They are the best in the world. We should not render them suspect on a series of false assumptions of inherent dangers arising from protein intakes that are reasonable, not to say adequate. This seems obvious. Few of us, however, are free of dietary prejudice; and for the elderly especially (and some of the reasons I shall present) the idea is deep seated—"You dig your grave with your teeth"—therefore eat little of that for the mastication of which they were ideally devised.

Primitive peoples of all periods have attacked and dispatched flesh food with gusto whenever they found it. African elephant hunters describe the same sort of feasts that Stefansson encountered among the seal-eating Esquimaux. (Recall also the relish they have for the raw viscera with their vitamin stores.) Somewhere, however, within the maze of medieval contrasts between gluttony and asceticism there arose antagonism toward the flesh meat. Religions, both Oriental and Occidental, found outlets for hygienic and spiritual guidance in restrictions, limitations and fastings in which the "flesh pots" attained conspicuous condemnation. The cost of meat and the difficulty of its preservation entered in and helped engender the class struggles still so much a part of life. I wish to make it clear that these esthetic, economic and traditional factors affect the older age groups in much greater proportion than the young.

So much has been published about life expectancy extension along national lines, it occurs to me that local statistics bring the situation much closer to our consciousness. To accomplish that purpose I submit some statistics recently compiled by Duluth's Health Commissioner.* They tell their own story. While the very great saving of infants under one year is admittedly the greatest source of life extension, still the gains after forty-five and the survivals after seventy-five are striking. No one should be surprised by the accumulating interest in Townsend Clubs and adventures in security.

TABLE I. AGE AT DEATH STATISTICS
(Duluth, Minnesota)

	1900	1937
Average age at death (arithmetical)	26.79	58.65
Deaths at age—under 1 year	24%	5%
over 75 years	4%	25%
Those attaining 45 years or more	24%	79%

The much publicized increase in life expectancy in the United States from 1901 to 1936 is featured in Table II.

A balanced diet for normal individuals is surely comparable, in promoting efficiency, to that of "a sane mind in a sound body." Most people do not need to be urged to eat. We may indeed have an excess of Sancho Panzas with us. Suit-

*I am indebted to Health Commissioner Dr. Mario Fischer for these Duluth figures and statistics.

TABLE II. INCREASE I— LIFE EXPECTANCY*
(1901 to 1936)

Year	Expectancy at Birth Years
1936	60.81
1935	61.37
1934	60.79
1933	61.26
1932	61.07
1931	60.26
1929-1931	59.57
1919-1920	56.42
1910	51.49
1901	49.24

able nutritive elements for the human gastrointestinal system are as important as a properly adjusted octane content gasoline is for a motor and its carburetor. When special emphasis is placed upon protein it is not an assumption that other necessary food elements are to be despised. This statement stems from the tendency of many people to develop their food habits with not only religious tradition but fervor as well. In other words, it is a highly personal matter conditioned by all sorts of circumstances including fads, fashions, and hunches, based on suppositions, someone's say-so, or confusions engendered by familial, social, environmental and personality quirks. The prejudice against protein has been considerable. As people grow older, age and the battle of life bequeath body squeaks, even as they come to used cars. To these weaknesses of the flesh is all too often added economic dependence. The obsolescence of skills and employment are the unhappy by-products of attempts at security which stand in the way of continued employment for the old. Consorts die and previously self-sufficient contented households are broken up. The "bachelor scurvy" so vividly described by Castle arises from the lack of incentive to prepare food for those eating alone or from fantastic choosing on the part of widowers, for example, long accustomed to conscientious safeguarding by their consorts. It is in this inelastic period of life people are prone to dump the blame upon something they ate. The salutation, "How's your liver?" of older times (likely an outgrowth of the era of humors) expressed a fundamental and physiologically sound approach to a good health appraisal.

Therefore, I turn to current research on liver function to help establish the principle of a higher protein bodily need than is usually considered.

The epochal work of Mann and Bollman and their co-workers on the protective values of foodstuffs in the matter of limiting hepatic lipid has focused our attention upon carbohydrates to sustain and prolong life in the presence of a severely damaged liver. This teaching has greatly influenced surgical and medical therapeutics. At the same time it is possible that it has more or less submerged the equally obvious circumstance that protein protects the normal liver. Time does not permit going into this in further detail except to point out the excellent experimental work with chloroform inhalation on animals made by Goldschmidt, Vars and Ravdin.⁴ These observers agreed with Mann and Bollman in according protective value to those foodstuffs which limit the deposit of liver fat. They point out that it is not true that protein is all immediately utilized unless fixed in living tissue. They give argument substantiating some degree of protein liver storage. They state that some of the carbohydrate protection afforded the liver comes indirectly through sparing protein for its more vital purpose. The essential point involved seems to be that protein is needed for the building of new body tissue, regardless of how the protein is spared or utilized. The basic need of protein is admitted. It is largely a question of how much.

The damage to hepatic cells after one hour's chloroform anesthesia increases progressively and decisively as lipid concentration in the liver increases. A high concentration of glycogen by itself did not seem to protect the liver of rats against the hepatotoxic action of chloroform. In general rats with high protein diet stood a lot more chloroform with less liver necrosis than those with depletion of protein stores after starvation. This is in a measure the story of alcohol and liver damage in the human.

The expression "living on the fat of the land" describes that finish and gloss (whether applied to man or beast) which properly acclaim and establishes the needful fat requirement. Burr² recently gave before the program at the University of Minnesota Fiftieth Anniversary Meeting a summary dealing especially with the highly essential fatty acids. On the same program Whip-

*Excerpted in part from Harwood, Murray P.: An Evaluation of the Factors for Public Health Progress in the United States. Science, 89:517, (June 9) 1939.

ple,⁸ of erythropoietic development fame, spoke upon the production, utilization, and significance of blood plasma. Not only did he mention the circumstance that the liver plays a very great part in the formation of plasma protein but pointed out that, in general, plant proteins are much less effective as a source than those coming from animal tissue. This introduces to us the whole subject of what is and what is not "proper and adequate protein" with the need of studies distinguishing the amino acids and attempting to allocate their distinctive properties and functions. McLester⁶ quotes from the Harvey lecture by Rose, "twenty-one known amino acids in purified form—yet one more, threonine, was indispensable for growth." The specific action of these proteins, simple or combined amino acid complexes, seem to trek hand in hand with certain of the vitamins and all are tied up with that intricate mechanism of tissue cell respiration for the elucidation of which Warburg over a decade ago received the Nobel prize.

The situations involved in the studies of energy release at the level of the cell membranes is abstruse but intriguing. This involves some very intricate biochemistry. Clinical physiologists (as attested by many articles) are currently striving to suggest its practical application. The subject was recently summarized editorially in the *Journal of the American Medical Association*.³ The circumstance which should challenge our attention (and urge continued attempts at understanding the chemical physical processes involved) arises from the readily understandable fact that (unlike energy release at very high temperature and pressure levels in a motor or furnace) living tissues must effect such release at relatively low temperatures. Active agents, the reverse of chlorophyll in plants, which link up radiant energy with water and carbon dioxide for plant growth (and in turn becomes the food for animal growth), must unloose this energy to living cells. Numerous catalysts further oxidation first by delivering hydrogen (dehydrogenation) to "acceptors"; to be followed by oxidation through a great variety of systems in which enzymes and co-enzymes promote the reaction. Up to date a great deal of theory intervenes but we know without any theory that inert proteins become living protoplasm and selective action by body cells occurs according to Whipple without the necessity of entirely breaking down protein mole-

cule aggregations into their component amino acids.*

Endocrine products (internal vitamins) may not be left out of this complicated set-up, as is well illustrated by the action of insulin on glucose. Tuttle⁷ has recently stated the probable mechanism of interaction of the pituitary and suprarenal through central nervous linkage with the blood stream demands, generated by tissue cell needs. The feature I return to is the circumstance that physiologists place the essential process of "phosphorylation" (break-down of the molecule to a size such that normal osmotic pressures suffice for capillary membrane permeability) chiefly in the liver. After insulin accomplishes this transfer of glucose to glycogen it has no further part in the metabolism of glucose. Arterial blood is said to contain no insulin. Its reaction, therefore, terminates at least with the entrance of blood into the left heart. Another biochemical observation bears upon phosphorylation and the liver. Spies states that the substance cocarboxylase (now synthesized) is as effective as thiamin chloride and is the latter substance after phosphorylation. He suggested its use in the circumstance where liver function is so far reduced that (comparable to the ineffectiveness of Vitamin K in marked liver function depression) thiamin would be inactive. No doubt as knowledge advances many of these conclusions may suffer adaptation, withdrawal or limitation. Nevertheless, at this time, liver assemblage, reconstruction and storage, may not be over-emphasized. Since the deposit of lipid in the liver is for the most part unfortuitous, and available glycogen is largely expedient for rapid and immediate energy release, then it follows that protein sufficiency is paramount. When we add to this the intricate and intimate specific manner in which certain amino acids are linked with enzymes, co-enzymes, endocrine products and vitamins, we begin to appreciate the early work of Goldberger, who pioneered with a diet rich in lean meat for pellagra, long before Elvehjem isolated nicotinic acid. The intimate association of these necessary stabilizing and protective substances with protein cannot be accidental.

It is possible to assemble a surfeit of clinical

*Biochemists link together cytochrome, Warburg's yellow respiratory ferment (containing riboflavin from B₂) and glutathione as active acceptors. Ascorbic acid⁵ and glutathione are ranked as the most active reducing substances in living tissue. The former is found most abundantly where cell activity is intense (suprarenal).

evidence that low protein diet where it has been the traditional rule is either valueless or (what is more likely) baneful. High protein diets are now recommended in acute nephritis (McKhann) where it is necessary to offset urinary protein loss; hypertension is in no way inhibited by leaving out meat and many subjected thereto become tired and anemic; arthritics (whatever the cause) need upbuilding and while gout may call for dietary direction, it is by no means controlled by fasting; much abuse exists in the treatment of peptic ulcer and so-called colitis by pap diets; obstetricians know that pregnant women (so commonly anemic) need forcing of a full diet even if exhibiting signs of toxemia; the condition described by Wills among women in India is practically the same as that described by Alsted¹ as extrinsic pernicious anemia and due to low protein in the diet; protein deficiencies in idiopathic hypochromic anemia are usual, secondary to the anorexia of achlorhydria—in fact a meat diet stimulates hydrochloric acid output. After all these are summarized, we return to the plight confronting those who are growing old, and if we observe carefully we find among them instances of malnutrition. When appetite recedes from any cause meat or its equivalent is usually the first item left out. This comes from necessity when economic reverses come; but to many the reversal is in the province of the mind. Physicians have all too long been guilty of blanket injunctions as nebulous as the miasmas—"cut down your eating"—"secure a bland diet"—"take nothing but white meat."

We know the chief issue behind the avitaminoses is proper food. Fortification with vitamin concentrates (Elvjhem) may be indicated in some soil-impooverished areas, but certainly not in our glorious midcontinental alluvial treasure land. It is far more than a medical problem to effect such distribution as common sense dictates must ultimately obtain. But we must now retract in terms of the convincing output of nutritional research, and gradually antidote, the damage we have previously done by suggesting low meat diets. As far as mental inhibitions are

concerned, it should be helpful to recall that researchers in nutrition unanimously report that the rat instinctively seeks and eats what he needs if he is able to get at it. Instinct is too often repellant to humans and their great gift of consciousness is diverted to the support of cultism, faddishness and mimicry. Women have long been accused of partiality toward this very human propensity. No man who ever takes the time to peruse our hospital diet lists or read a book replete with dietary outlines would ever recognize in his sex any notable insulation toward the same tendencies. Every folly ever embodied into routine textbook fill-ins that supposedly outline dietary regimen in various disease states continues the incubus with each revision or translation.

There will be a tendency on the part of a few to reject this thesis. Some will confuse the urge to eat normally with justification of gluttony. Others may confuse the issue of obesity or its associates, diabetes and arteriosclerosis (so fearsome to insurance actuaries). But we may add, where shall we turn unless to adequate protein, to keep down weight, avoid overtaxing carbohydrate tolerance (Joslin), or (if you think O'Leary's lead is right) postpone lipid arterial infiltration. Certainly as the years extend and senescence arrives, proper guidance includes accommodating effort to capacity. That, with explicit application of the principles I have outlined, is the chief concern and purpose of geriatrics.

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While stomach lavage is not practical or even necessary for universal use, no patient with clinical signs of tuberculosis who has negative saliva should be considered negative for the disease until stomach lavage has yielded negative results. The absence of tubercle bacilli in only one stomach washing does not necessarily signify that the disease is arrested, especially when the collapsed lung is re-expanding. A. Stadnichenko, M.D., et al, *Jour. A.M.A.*, February, 1940.

GENITAL TUBERCULOSIS*

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PROGRESS in the early diagnosis and treatment of renal tuberculosis did not occur until urologists and phthisiologists, working together, began to study the disease—tuberculosis—which disclosed that lesions in the kidney are local manifestations of a generalized infection. During this study it became apparent that the route of spread of the infection from the chest cavity to other organs and tissues is lymphohematogenous. This means that all tissues or organs in the body may become infected with bacilli of tuberculosis when spread has occurred from the chest cavity. Local susceptibility, anatomical and developmental faults, the number of blood vessels in organs and tissues seem to be factors that determine which ones are most often infected.

A careful review of the literature and the data obtained from our clinical study of many patients reveals that the diagnosis and treatment of lesions of tuberculosis of the genital tract require the same understanding of the disease tuberculosis and the route of spread of infection as does tuberculosis of the kidney.

Route of Spread to the Genital Tract and the First Organs Involved

The route of invasion, the location of the first lesion, and the method of spread of bacilli of tuberculosis to and in the genital tract are etiological factors about which there is still no general agreement among urologists and phthisiologists. When evidence of spread from the chest cavity has occurred, we find that the kidneys will be involved in 4 per cent and the genital organs in .6 per cent.

How do bacilli of tuberculosis reach the organs and tissues in the genital tract? Some observers are quite sure that the only route of invasion is via the blood stream and that when this occurs the epididymi or the seminal vesicles are first involved. Others believe, including ourselves, that bacilli of tuberculosis present in the urine from a renal lesion may infect the prostate

gland via the mucosa of the posterior urethra and the prostatic ducts and from here spread to other genital organs. Some clinicians recognize the possibility of both routes of infection being operative when the genital organs are involved.

Moore,¹⁷ a pathologist from the New York Hospital, examined serial microscopic sections of certain areas of autopsy specimens of the prostate gland. Moore tried to determine the most frequent location of lesions of tuberculosis in the prostate gland and the anatomical relationship of the lesions to the duct openings, the blood vessels and the acini of the glands. Moore found the majority of microscopic lesions near the blood vessels, and at the periphery of the prostate gland, so that he states that the route of invasion is most often via the blood stream.

Data obtained during our clinical examinations of both normal and pathological tissues and organs removed by surgical operation or during autopsy do not agree with Moore's published opinions concerning the most frequent route of invasion of the prostate gland by bacilli of tuberculosis.

We are sure that an organ like the kidney or the prostate gland must be completely serially sectioned and all sections examined through the microscope before one can say that the organ does not contain a lesion of tuberculosis.

The statements made and the opinions expressed in this paper are based on: (1) the data obtained during repeated urological examinations and the clinical data in the records of many patients who had some lesion of genital tuberculosis and who were observed at Glen Lake Sanatorium; (2) the pathological study of tissues removed during surgical treatment and at autopsy; and (3) a study of the data obtained from the autopsy protocols of 17,777 consecutive autopsies done by members of the staff of the Department of Pathology of the University of Minnesota.

Glen Lake is a county tuberculosis sanatorium

*Thesis read before the Minnesota Academy of Medicine, November 8, 1939.

and has a bed capacity of about 700. All age groups and patients with all types of lesions of tuberculosis are admitted to this institution so that we have an opportunity to study and to observe the disease tuberculosis in all its forms.

The relationship of lesions that occur in the urogenital tract to other lesions of tuberculosis and methods of spread were studied in eighty-seven patients who had some lesion of genital tuberculosis and who could be followed for at least two years. Eighty-seven per cent of this group had demonstrable lesions of tuberculosis elsewhere, 78 per cent being in the lungs. Sixty-four of our cases were well enough so that they could be repeatedly examined over a period of at least two years. *Ninety-two per cent had evidence of a lesion or lesions of renal tuberculosis.* The diagnosis of the renal lesion was made following repeated guinea pig inoculations of the urine sediment obtained from both kidneys.

Thirty-eight of our cases were examined before we were aware that lesions of tuberculosis in the genital organs begin in the prostate gland and that they are secondary to hematogenous lesions in the kidney. Routine instrumental examinations of the prostatic urethra and the ducts of the prostate gland were not made at this time. Many of the patients in this group of cases had epididymectomies before coming to the sanatorium. Many had no urological examinations.

During the time that we have routinely examined the kidney for evidence of the primary urogenital lesion, and since we have searched for lesions in the prostate gland, we have not failed to find evidence of a tuberculous lesion in the prostate gland when other genital lesions are present.

The data obtained from examination of twenty-three autopsy specimens more accurately reveal the facts concerning the first lesion of tuberculosis in the genital tract. We found evidence of tuberculosis in every prostate gland removed from patients who had genital lesions of tuberculosis. The kidneys removed from these patients contained easily demonstrable lesions of tuberculosis in twenty-two instances.

When genital lesions of tuberculosis are found or are suspected, *the whole urogenital tract should be carefully examined.* Our routine urological examination for evidence of urogenital tuberculosis not only includes the examination of

the kidneys but the genital organs and tissues as well. The utriculus, prostatic urethra and ducts of the prostate gland are always carefully examined through the endoscope or cystoscope. We have found evidence of infection in the prostate gland, *i.e.*, large duct openings and cavities, when the patient had no urinary symptoms or clinical findings suggesting lesions in this anatomical area. We believe that the prostate gland can be infected without the infection spreading from this organ into the vas, epididymis, or the seminal vesicle. We have examined many patients in whom evidence of tuberculous infection of the prostate gland could be demonstrated when the palpating finger introduced into the rectum did not find irregularities, nodules or firmness. In some instances we have found the size and extent of lesions in the prostate gland to be out of all proportion to a small lesion that may be found in the kidney. Our clinical data, obtained during careful repeated urological examinations of many patients with lesions of urogenital tuberculosis, disclose that the prostate gland is the first organ of the genital tract invaded with bacilli of tuberculosis.

One of us (Stebbins)¹⁸ recently examined the autopsy protocols of 17,777 consecutive autopsies done by members of the Department of Pathology of the University of Minnesota. In this group Stebbins found 1,283 cases having some gross evidence of infection with the bacillus of tuberculosis. Two hundred of these cases had some lesions of urogenital tuberculosis. Forty-five had lesions in the prostate gland, forty in the urinary bladder, twenty-three in the testes, sixteen in the epididymi, and fourteen cases in the seminal vesicles. Stebbins found thirteen instances of associated lesions in the epididymi and the prostate gland, and only three cases of tuberculosis of the epididymis not associated with infection in the prostate gland. Only four of the fourteen cases of tuberculosis of the seminal vesicles had no gross evidence of lesions of tuberculosis in the prostate gland. Most of these diagnoses were made following inspection of the gross specimen; some by microscopic examination of tissue removed from suspicious areas. The data from the examinations here quoted might have been different had serial microscopic studies been made of the whole organ. We believe that if this could be done, all patients with lesions of genital tuberculosis would have

an active focus or at least some evidence of an old lesion in the prostate gland.

Fenwick,¹¹ who reported data from 157 autopsies, found 3 per cent of urogenital lesions of tuberculosis in the prostate gland alone, 24 per cent in the prostate gland and epididymis, 3 per cent in the prostate gland and vesicle alone, and 6 per cent in the prostate gland and bladder.

In 1903, Hanson¹² produced tuberculosis of the epididymis and the testicle of rabbits by injecting bacilli of tuberculosis into the vas deferens. He found tuberculosis of the bladder almost always associated with tuberculosis of the utericle and the prostate gland.

Barney and Cabot⁷ reported data from 101 cases of urogenital tuberculosis and found the prostate gland involved in 75 per cent.

Collinet⁹ found the kidneys and prostate gland the urogenital organs most often infected with bacilli of tuberculosis. These may be the only urogenital organs involved.

Howard Jeck¹⁴ of New York, reporting from the Bellevue Hospital, found genital lesions present in a large percentage of cases of renal tuberculosis. Jeck's opinion is that lesions of genital tuberculosis always suggest the presence of renal infection. The examination of the genital organs during four autopsies which Jeck made upon patients who had renal tuberculosis disclosed lesions in the prostate gland in three.

Menville and Priestly¹⁶ of the Mayo Clinic recently published the data obtained from their pathological study of prostate glands removed from patients who had died of some lesion of tuberculosis. The prostate gland was, because of its close proximity to the urinary tract, the first and most frequent genital organ involved. Early small lesions of tuberculosis were very hard to find in the prostate gland. By direct extension these may involve the epididymis or other genital organs. These writers report that the epididymis, the testicle and the seminal vesicle may, at times, be the primary seat of genital infection with the bacillus of tuberculosis. In their opinion these lesions are blood-borne although Menville has reported that lesions of renal tuberculosis were associated with genital lesions in 74.2 per cent of his cases that did not include miiliary infections.

Wells¹⁹ found tuberculosis of the epididymis invariably secondary to lesions of tuberculosis in the kidney. This writer did not mention the

prostate gland as probably the first genital organ involved.

Some writers have reported *primary lesions of tuberculosis* in the genital organs. We have never encountered one during many years of experience. Primary lesions of tuberculosis in the chest cavity may be minimal, may not produce local symptoms, and lesions that occur elsewhere following spread may be gross lesions which produce many symptoms. Lesions in the kidney that eventually produce metastatic lesions in the genital tract may be minimal ones. The bladder infection, if present, may produce no symptoms and cystoscopic examination may not reveal much evidence of a secondary cystitis, but the prostate gland may become infected and the epididymis may reveal evidence of secondary lesions.

Route and Method of Spread in the Genital Tract

We believe that the mucosa of the prostatic urethra, the ducts of the prostate gland and their openings, and the ejaculatory ducts and their openings may become infected with bacilli of tuberculosis that are present in the urine.

Spread may occur by direct extension along the mucosa of the ampulla into the seminal vesicle and along the vas into one or both epididymi. Clinical reports show that bilateral epididymitis occurs in 60 to 75 per cent. We believe that this large percentage of bilateral infection in the epididymis occurs because the utriculus may be frequently reinfected by chronic lesions in the substance of the prostate gland and its duct. Lesions in the seminal vesicle may occur with none (rarely) or only minimal lesions in the prostate gland.

Diagnosis of Lesions of Tuberculosis of the Genital Tract

The diagnosis of lesions of tuberculosis in the genital tract may be very difficult. Lesions may be present in the prostate gland and seminal vesicles without producing urinary or other symptoms noticeable to the patient. Rectal palpation may not reveal nodules, induration or infected areas. Acute lesions of tuberculosis of the seminal vesicles are reported. I cannot remember one such case in over eighteen years of study of urogenital tuberculosis. In association with tuberculosis of the prostate gland I find

tuberculosis of the seminal vessels occasionally but not as frequently as has been reported in the literature. It is difficult to make a positive diagnosis of tuberculosis of the seminal vesicles except when a firm indurated organ may be palpated and when the examination of the expressed secretion reveals bacilli of tuberculosis.

We frequently find evidence of tuberculous infection in the prostate gland with the cystoscope or urethroscope during routine examination of the whole urogenital tract. We may find large infected ducts of the prostate gland and small areas of necrosis surrounding the duct openings and in the substance of the gland from which pus exudes when pressure is made over this area. Nodules, irregularities, indurations and firmness found in the prostate gland with the palpating finger in a patient who has or who has had any lesion of tuberculosis, active or at the present time quiescent, should be considered a lesion or lesions of tuberculosis.

Tuberculous lesions in the epididymis produce swelling, tenderness, induration, irregularity in the contour of this organ and frequently a cord-like swelling and induration of the vas deferens. Subacute tuberculous inflammation may occur in the epididymis. This may be recognized clinically as a slightly swollen tender epididymis that is not nodular. Trauma frequently activates this subacute condition so that acute symptoms such as pain, swelling, high temperature and tenderness occur. This subacute condition in the epididymis is always associated with active infection in the prostate gland. This may be caused by the bacillus of tuberculosis or other bacteria and may go unnoticed if trauma had not been applied to the epididymis. Secondary infection may be present so that a differential diagnosis must be made. This is not difficult when any discharge from the urethra may be examined. If a lesion or lesions of tuberculosis are known to exist elsewhere in the body, the examiner must assume that those in the prostate gland and epididymis are tuberculous.

The first lesions of tuberculosis in the human body (except the bovine type, which is rapidly disappearing in this country) begin in the chest cavity, so that any lesions found elsewhere are metastatic ones and are evidence of a hematogenous spread from the chest cavity. However, lesions of tuberculosis in the epididymis are secondary to those in the prostate gland in

most instances, and the kidney contains the primary hematogenous lesion or lesions in the urogenital tract.

Treatment of Tuberculous Infection in the Genital Organs

Before treatment for lesions of tuberculosis in the genital tract is undertaken, the patient should be thoroughly examined for evidence of other lesions of active or quiescent tuberculosis. The urogenital tract should be thoroughly examined for evidence of lesions elsewhere in the genital tract and for the primary lesions in the kidneys. When the data obtained during these examinations are at hand the treatment of the genital lesions may be planned. When active lesions are found in the chest cavity or elsewhere, hygienic treatment only should be started. Most patients with any lesion of tuberculosis will gain if they are put at rest in bed. Heliotherapy may be used if this is indicated and if it is beneficial to the patient.

If a renal lesion is found this should receive appropriate treatment before treatment of the genital lesion is started. The surgical or other treatment of a renal lesion plus continued hygienic treatment after surgical operation will control and arrest lesions in the prostate gland.

Surgical extirpation of the prostate gland is never necessary.

Tuberculosis of the seminal vesicle will recover without surgical treatment if tuberculosis of the kidney is brought under control and hygienic treatment is practiced long enough. Lesions of tuberculosis in the epididymis should be treated actively, but surgical treatment is not always necessary. We have found continuous heat therapy locally, the surgical drainage of abscesses near the skin, and hygienic treatment satisfactory in most cases. The prolonged and continuous application of heat for long periods may be all the local treatment that is necessary. When other lesions of tuberculosis of the urogenital tract and elsewhere in the human body have been controlled and when local treatment of the epididymis has been unsuccessful, then we believe that surgical dissection and removal of the epididymis and the vas up to the internal ring should be practiced. We do not remove the testicle, and we are very careful to try to preserve the blood supply of this organ, although we are not always successful. The blood ves-

sels of the epididymis and the testicle anastomose freely. There are many different anatomical arrangements of the areas where anastomosis of these vessels occurs. When complete dissection and surgical removal of the epididymis and the vas is necessary, slough or atrophy of the testicle may occur, although careful protection of the vessels in the cord was practiced during surgical treatment. Inadvertently, the surgeon may remove all the blood vessels which supply the testicle when careful dissection is made and the epididymis is removed.

Following the surgical removal of the epididymis or any other organ containing a lesion of tuberculosis, the patient should remain in bed for at least three months at complete rest. This is advised so that active lesions which may have been undiscovered and others which may have been activated by the surgical trauma may again become inactive and quiescent.

Conclusions

1. Tuberculosis of the genital tract is a local manifestation of a general disease and lesions here are most often secondary to a primary urinary tract infection in the kidney. The treatment plan of the local genital lesion or lesions must be based on this pathological fact.

2. The route of spread from the kidney to the genital tract is most often via the urine.

3. The primary lesion in the genital tract is most often the prostate gland. From here the infection may spread to the other genital organs. Foci of tuberculosis in the prostate gland may produce no symptoms.

4. The seminal vesicle is infrequently infected with the bacilli of tuberculosis and is most always associated with lesions of tuberculosis in the prostate gland.

5. Tuberculosis infection in the epididymis is secondary in the genital tract to tuberculosis in the prostate gland. There may be a subacute stage of tuberculosis of the epididymis which is activated by trauma.

6. Treatment of lesions of tuberculosis in the genital tract consists of:

(a) The location and arrest of other lesions of tuberculosis and of the primary focus in the urinary tract by whatever means are necessary.

(b) Hygienic treatment of lesions of tuberculosis in the epididymis and heliotherapy to be followed by application of heat, incision and drainage, and surgical removal when indicated.

(c) Orchidectomy is rarely necessary.

(d) Hygienic treatment for tuberculosis of the prostate gland and seminal vesicles after removal or arrest of other active foci in the urogenital tract is always practiced. Surgical removal of these organs is seldom necessary.

(e) Postoperative rest for three months is always essential.

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TUBERCULOSIS IN THE AGED

It is known that when old people are found to have tuberculosis it is almost impossible to teach them to take care of themselves and protect others from infection. They will not cover their mouths during a cough or sneeze, nor will they try to protect or destroy their sputum. Their idea is that they have lived all these years with this old cough, it will not hurt them and they do not see how they can hurt anyone else. Elderly people with a chronic cough and positive sputum are a menace to society and should be isolated. C. L. Harrell, M.D., *Virginia Med. Monthly*, November, 1939.

SURGICAL DRAINAGE OF THE ABDOMEN*

A Review of Literature

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TAIT'S dictum of 1911, "When in doubt, drain," has been, for more than two decades, the guide of many surgeons, but drainage has been practiced since the time abdominal surgery began. References are made to it in the old Greek literature. Mikulicz, about 1860, first expressed the rather daring and bold opinion that a gangrenous appendix might be removed and the peritoneal cavity closed without a drain (Cafritz).⁶ Jennings¹⁹ says that drainage of the abdomen seems to have remained more a matter of empiricism than of reason. There has been more attention directed, of late years, to the possibility of non-drainage and in 1929 W. J. Mayo was led by his observations to make a dictum to the effect that "When in doubt, don't drain." Warbasse feels that Mayo's dictum is becoming more popular.

Types of Drains

There is a great diversity of opinion as to what type of drain is to be used if drainage is instituted.

Jennings¹⁹ states that the ideal drain would be one which produced no exudate and caused no damage by its presence, which absorbed and removed the fluid present or about to form immediately and which could be removed without trauma to the surrounding structures. It should be highly and durably capillary and must be completely sterilizable. At present, we have no drain approximating these requirements, but Jennings feels that raffia has possibilities for the future.

Arnheim and Neuhof¹ feel that tube drainage should not be employed, for the following reasons:

1. There is no assurance that the tube remains where it is placed.
2. There is post-mortem evidence of residual abscesses about tube drains.
3. There is an irregular collapse of the walls of an abscess cavity or infected bed around

and beyond the tube with consequent tendency towards pocketing.

4. With drainage tubes, foul discharge and sloughing are commonly noted postoperatively.

They consider perfunctory gauze drainage in the same category as tubes, but add that gauze drainage is correct only if the infected area or areas are packed openly from the bottom. They seem to follow Tait but they use strips of iodoform gauze which are packed into all the recesses of the cavity or cavities or in non-abscess cases if appreciable purulent exudate exists or when the appendix or diseased viscus has been attached to an obviously infected bed. Drains are not disturbed until loosened by discharge, which they find is rarely profuse and rarely foul. The gradual shortening of the drain is begun usually about a week after the operation.

Spelman,²⁹ working with Hertzler, feels that rubber tubing drains delay formation of a thrombus in vessels while gauze may promote it. On the other hand, rubber tubing may cause rupture of blood vessels if it is allowed to come in contact with them over too long a period.

Tenopyr and Shafiroff³³ state that gauze is ideal for hemorrhagic abdominal areas where ligation is ineffective, but Shambaugh and Boggs²⁸ feel that exposed gauze should be avoided whenever possible. When the drain is for the control of bleeding and the hemostatic effect of the gauze is required, the cigaret type of drain should be employed and care be taken that only the gauze which is in direct contact with the bleeding tissue is left uncovered by the rubber casing.

Gauze packing like Mikulicz' drain or Joseph Price's cofferdam used in the pelvis for draining localized abscesses serves the purpose of draining but causes endless convalescence and dense and lasting adhesions (Ford Eastman).¹³

Chaffin⁸ feels that the only type of drainage of value is the capillary drainage, the value of which is only minimal and of short duration. He, therefore, believes that gravity or suction drainage alone is of value. Open tubes or drains

*Prize essay in contest open to Duluth internes and sponsored by the Duluth Surgical Society in 1938. Read before Duluth Surgical Society and at annual meeting of the Wabasha County Medical Society, Lake City, October 5, 1939.

afford outlet for much exudate under pressure but do not drain.

Summary.—At present, we have no ideal drain meeting the requirements of Jennings, chief of which are that the drain absorbs and removes the exudates well and does not produce damage to tissues.

Experimental Investigation of Drains

Several investigators have contributed much to the profession by their experimental studies on drainage.

Hertzler,¹⁸ in 1919, in his monograph on the peritoneum, described the changes occurring when the endothelium of the peritoneum is traumatized. He found, to begin with, that the endothelial cells are not easily removed for microscopic study and it is only when reactive processes are added to mechanical insults that the cells readily loosen. A great deal of energy must be applied to secure an abrasion by rubbing with a piece of gauze. Certainly, no manipulation with gauze within the range of operative technic is sufficient to dislodge the cells. Trauma, even to this extent, is not followed by reaction other than the formation of an exudate with prompt endothelialization. The bite of forceps and traction with sharp-pronged hooks are much more deleterious sources of trauma. With these instruments solution of continuity of the basement membrane may be produced which may be the source of permanent adhesions. A source of still more mischief is the ligation of pedicles, leaving an exposed stump which is capable of injuring normal surfaces with which it may come in contact. When the mechanical injury extends to a sufficient degree to cause death of tissue a reactive process follows. The dead tissue institutes the same sequence of symptoms that bacterial toxins produce.

When the processes of inflammation and wound healing coexist, the latter can become active only after the former has overcome the noxious agents. The tissues possess a certain capacity to prevent the growth and development of bacteria, but the conflict in the tissues may be so slight that it does not find expression in marked subjective or objective changes generally recognized as inflammation. The surgeon is apt to depend too much on the ability of the peritoneum to take care of a certain amount of infection because animal experimentation and clinical experience have shown that it is capable of do-

ing so. Did he realize that by just so much is final healing retarded he might manifest a greater reluctance in adding the additional burden. Devitalized tissue is as important as bacteria in producing minor disturbances in wound healing. There is no dividing line between the formation of fibrous tissues, the healing of wounds, and the formation of adhesions.

The rule is universal that what the peritoneum cannot absorb, it walls off or dies in the attempt. Any foreign body not capable of prompt absorption is walled off. Therefore, any foreign body placed in the peritoneal cavity to prevent adhesions must, most certainly, induce that which it was intended to prevent.

Yates,³⁶ in his Senn prize monograph of 1902, on abdominal drainage, conclusively demonstrated that drains do not drain after twenty-four hours.

In a series of dogs under sterile precautions, drains were inserted into one flank. The animals were allowed to recover and after stated time intervals incisions were made below the ensiform cartilage. The animals were placed in high Fowler's position and a solution of normal saline colored with carmine red was allowed to run in through the above opening. Control incisions were made in the opposite flank and a fresh drain was inserted at the time of the second procedure. In no case did the original drain discharge any of the injected colored fluid although there was always a flow from the new drain. Autopsy examination of the animals proved that the drains were completely walled off from the general peritoneal cavity, isolation of the drain occurring, usually, within four to six hours, being complete in twenty-four hours. It did not matter whether gauze, rubber, or a combination of both were used; the end-result was the same. The infected peritoneum preoperatively injected with virulent staphylococcus cultures reacted to foreign drainage in very much the same manner, but much more rapidly, in the process of encapsulation of the drain. Yates observed that animals with generalized peritonitis reacted to the presence of a drain by the severest type of inflammation. If these animals recovered, the areas encapsulating the drains consistently showed the invading organisms in the postoperative adhesions long after recovery occurred. Yates claimed that drainage for animals, suffering from generalized peritonitis, was more detrimental than beneficial.

Yates gives the necessary explanation for the profuse purulent discharge that soaks the gauze and is such a delight to the surgeon who believes he is actually removing toxic material from the cavity. The seropurulent discharge found on the dressing is in all cases a serous discharge, a part of the exudative phenomenon of the particular area of peritoneum irritated by a foreign substance (the drain) and contaminated by a foreign substance—as Councilman has shown by cocci that have travelled down the drain. This discharge will continue to flow as long as the drain remains in the cavity. Yates' graphic description of the gross and microscopic pathological changes that occur with peritoneal drainage follows:

"There is, at first, a serous exudate associated with local hyperemia. As the inflammatory reaction increases, a fibrinous exudate is formed and there is more intense local congestion and some edema. The serosa loses its luster and is finally covered with opaque fibrin. This fibrinous surface persists in the presence of smooth drains for at least seven days. Gauze drains, however, act differently. The fibrin becomes incorporated in the meshes, followed by an ingrowth of granulation tissue, so that when the gauze is removed, instead of leaving a smooth surface it is rough and bleeding, with fibrin and superficial tags of granulation tissue still clinging to portions of the gauze. The serous exudate is most abundant during the first few hours (four to six), when it becomes noticeably less in amount and concomitantly there begins the visible deposit of fibrin. This serous excess is manifested during this time by the wetting of the abdominal dressings and by the appearance of an increased amount of intraperitoneal fluid which disappears about the time of isolation of the drain by adhesions is affected. The character of the adhesions varies with the nature of the drain—the greater and more prolonged the irritation the more intense the reaction and the finer the adhesions. All serous surfaces, visceral or parietal, react similarly."

Any foreign body allowed to remain in the peritoneal cavity results in adhesions. Blood clots beneath the peritoneum undergo organization and produce adhesions.

Hertzler stated that if the edges of the peritoneum are carefully everted into the incisional wound at the time of closure, allowing only a small suture wound to present toward the peritoneal cavity, adhesions are prevented with a considerable degree of certainty. His observations are sufficient to demonstrate the importance of the cut edge of the peritoneum whether by the teeth of forceps or marked blunt trauma inflicted by retraction in inverting adhesions. All

that the surgeon can do to prevent adhesions is to operate with the utmost gentleness, placing the minimum of foreign bodies of all sorts, either temporary or permanent, within the abdominal cavity, and cover the denuded surface as carefully as possible.

Yates, in his conclusions, states that drainage of the general peritoneal cavity is both physically and physiologically impossible. He says that "peritoneal drainage must be local and unless there is something to be gained by rendering such an area extraperitoneal or by making such an area a safe path of least resistance leading outside the body, there is, aside from hemostasis, no justification for its use."

Indications for Drainage

Today, the main controversy is not how to drain but whether or not drainage is necessary, and if it is necessary, when it should be done. A general review of the literature on appendicitis reveals the fact that no amount of analysis allows for any dogmatic statements on the question of drainage. The great bulk of the literature on the drainage of the abdomen deals specifically with appendicitis. However, the general conclusions concerning drainage of diseases of the appendix will hold for many other diseases of the abdominal cavity. It is a generally accepted statement that drainage of the entire abdominal cavity is impossible and therefore of no value in peritonitis.

Richter²⁷ of New York and Hustinx (Willis and Mora)³⁵ of Netherlands feel that the presence of a serous or purulent fluid is not an indication for drainage, but rather the possibility of not being able to remove for one reason or another the entire source of infection.

Ford Eastman¹³ uses the indications of British Surgeons for draining: uncontrollable oozing, pyogenic membrane, or fecal fistula, present or imminent. Muelleder²⁴ of Germany adds the following to his list of definite indications: Children under ten years of age and patients over fifty years of age, when the intestinal coils are covered with much deposit and are agglutinated (pyogenic membrane), when the foul-smelling exudate is present in large amounts and when the pus from the pouch of Douglas, from the region of the liver, from the gastric gutter, or from the left side, flows toward the incisional wound. He therefore drains most of his cases.

It is the almost universal opinion of surgeons contributing to the literature, that a chronic localized abscess should be drained. For some, including Trinca,³⁴ Rhodes and Fernald,²⁶ and others, including Andrews, Miller, and Gatch as quoted by Rhodes and Fernald, a walled-off abscess is the lone indication for drainage. Straus and Tomarkin³² and Willis and Mora,³⁵ among others^{11,16} feel that a contaminated peritoneal cavity should be included with the chronic abscess for drainage indications. Arnheim and Neuhoof,¹ Gile and Bower,¹⁵ and others^{9,12,17,22,24} follow Tait's dictum of drainage when in doubt.

The rationale of draining is based on the prevalent, but probably erroneous, belief that though the absorption power of the peritoneum is, in comparison with other serous membranes, very great, the mechanical release through a drain of infectious substances is bound to speed up recovery and to facilitate healing (Cafritz).⁶

Weil says that "peritoneal exudation is evidently the sole means of defense possessed by the abdominal cavity." Murphy considers the removal of exudate from the abdominal cavity a great error, as the necessary defensive antibodies are also removed together with the exudate. He believes that the purulent exudations contain defensive elements and that the removal is harmful to the patient. Peterman agrees with Murphy's views as far as early exudates are concerned. He believes, however, that when the exudate becomes ichorous and purulent, and contains intestinal matter, necrotic tissues or other foreign matter, the exudate does more harm than good (Breitmann).²⁹

Bunch and Doughty⁵ concur in the belief that the inflammatory exudate so often found in the peritoneal cavity at operation is not protective and germicidal, but may be harmful and should always be removed.

Breitmann³ feels that in cases of peritonitis the water metabolism of the body is greatly disturbed by the loss of fluids which Rhodes and Fernald,²⁶ agreeing with Weil and Breitmann, believe contain the body defensive elements.

Grossan¹² favors drainage because he feels it relieves tension and protects against possible intestinal leak, but he urges caution in using drains because it must be remembered that a drain is an ordinary foreign body and must be placed in positions that are harmless to the tissues.

Summary.—Surgeons differ in their opinions

concerning the indications and necessities for drainage. Most surgeons probably feel much the same as Peterman in that early exudates are beneficial but that later exudates, ichorous and purulent, consisting of intestinal matter, necrotic tissue or other foreign material, are harmful and should be removed. All agree that a chronic localized abscess should be drained.

Factors Affecting Results in Analyses

Many articles in the literature on drainage and appendicitis were purposely free from any statistics because it was felt that there were too many factors involved in analyzing a series of cases, so that statistics on morbidity and mortality have little or no value.

Willis and Mora³⁵ and likewise Colt and Morrison¹⁰ feel that drainage has no effect upon the mortality rate but that the rate is more dependent upon the duration of symptoms before operation, the extent of the pathological changes, the virulence of the offending organisms and the resistance of the patient. It is interesting to note, however, that Colt and Morrison had a mortality rate distinctly lower in their series of non-drained cases.

Studying the relationship between the duration of symptoms and the mortality rate, Stanton³¹ has graphically shown that, in a compilation of cases from recent literature, after the attack has begun, the mortality rate of acute appendicitis varies greatly with the time that elapses before operation.

Day of Operation After Attack Began	No. of Cases	Deaths	Mortality Percent- age
First day	1,507	20	1.3
Second day	912	33	3.6
Third day	663	56	8.9
Fourth day	365	46	12.9
Fifth day	442	49	11.6
Sixth day	346	29	8.4
Seventh, eighth, ninth days	178	5	2.8
Tenth day or later	288	7	2.4
Total	4,692	245	5.22

From these figures if the rule—operate before the third day or wait until after the sixth day from onset—were blindly followed, the mortality

rate would be cut in half. The mortality rate in most series of cases does not amount to more than 3 per cent.

Another factor in making the mortality rate in the drained cases seem higher than in the non-drained cases is that most surgeons drain the severest cases even when they treat the rest of their cases by non-drainage.

Kirtley and Daniel²¹ feel that the age of the patient is important in analyzing statistics. Their review of the literature showed a mortality rate in children under ten to be 23 per cent, and above the age of fifty years to be 15 per cent and rising with age. The mortality rates are lower in the age groups between these limits, being lowest in the age group of fifteen to twenty-five years, where it is 3 per cent.

Analysis of Methods and Results

Glasscock¹⁶ reported 457 non-drainage cases with one death due to bleeding from the slipping of a ligature on the mesoappendix. The drained cases had a mortality of 11 per cent, but he stated he generally drains the worst cases. McClure and Altemeier²² also had a mortality rate of about 11 per cent in their series of 252 consecutive cases of acute perforated appendicitis with peritonitis. All of their cases were drained.

All surgeons contributing to the literature agreed that a chronic localized abscess should be drained. Extraperitoneal drainage apparently gave the best results. Shambaugh and Boggs⁶ use a simple rubber tube to produce a sinus tract through which an underlying abscess may later be evacuated extraperitoneally. The drain is usually removed the fourth or fifth day and the abscess ruptured through the resulting sinus tract. When they insert a drain into the infected peritoneum in which one suspects that an abscess would form if drainage were omitted, the drain is not removed before the fourth day or before a structural tract is formed. Drainage of cul-de-sac abscesses per rectum is condemned. Most surgeons treating an abscess remove the pus by aspiration and sponge, dissect out and remove the appendix or source of infection if possible, insert drains and close up the abdomen.

Breitmann³ inserts one drainage tube between the omentum and the abdominal wall and feels he accomplishes as much as if he inserted a tube into the pouch of Douglas. The tube is removed the fifth to the seventh day. He states, however, that he does not circumvent the formation of ad-

hesions. Buchbinder⁴ agrees with Breitmann and follows the same procedure.

Newell²⁵ tried to treat all his cases alike with the same indications. He had fifty-six cases, twenty-three of which were not drained. There were no deaths in this group not drained, although there were eight deaths in the thirty-three drained cases.

Herrick¹⁷ treated 217 cases of acute appendicitis with peritonitis by immediate surgery and drainage. In his series he had five deaths—a mortality of 1.84 per cent.

Jones²⁰ treats his cases by appendicostomy with a catheter inserted into the appendiceal stump. Nourishments are given through the catheter and nothing per os for as long as perhaps five days. The suture through the skin and the tube is usually removed about the sixth or seventh day, and the tube is permitted to come out spontaneously. No fecal fistulae have ever developed. He maintains normal physiology is more closely approached than by any other method employed. In a series of seventy-five cases he had a mortality of but 1.4 per cent. He reports that Wilkie of Edinburgh and Gatch have had similar experiences employing this method.

Cafritz⁶ referred to Marchini of Italy for figures on drainage and peritonitis. In this series of 301 cases of localized peritonitis, 184 were drained. There were nine deaths, a mortality rate of 4.88 per cent. One hundred and seventeen cases were not drained, with two deaths, a mortality percentage of 1.71. One hundred and one of the 142 cases of diffuse peritonitis were drained. There were thirty-one deaths, a mortality percentage of 30.69. Seven deaths, a mortality rate of 17.07 per cent, occurred in the forty-one non-drained cases of diffuse peritonitis.

One of the most interesting contributions to the subject of appendicitis and drainage was made by Cayford⁷ in his review of 614 cases seen at the Montreal General Hospital during the years 1931-1933. The average duration of illness prior to operation was 2.1 days. The patients averaged 15.99 days in the hospital. There were twenty-one deaths, a mortality percentage of 3.42. The patients were divided into three groups.

It will be observed that in Group B the drained group had a hospital stay of about seven days more than the non-drained group and the mortality percentage is about three times as great.

GROUP A. Acute diffuse or acute suppurative appendicitis, in which little or no inflammatory process extended to the surrounding tissues. No drainage.

Number of cases.....	266
Average days in hospital.....	11.34
Wound infections.....	2
Death	1

The fatal case was that of a female, aged 28, who had suffered from general debility associated with long-standing kidney disease. She died on the thirteenth day after operation with acute gangrenous cystitis with uremia.

GROUP B. Spreading or diffuse peritonitis was present.

In each case free fluid or free pus was found at operation. In each there was a pathological report of acute suppurative, acute gangrenous, or acute perforative appendicitis.

Number of cases.....	265
With drainage	
Number of cases.....	111
Average days in hospital.....	21.42
Deaths (9.01%).....	10
Complications	
Wound infections.....	5
Fecal fistulae.....	2
Residual abscess.....	2
Deaths: Generalized peritonitis usually uncomplicated.	
Without drainage	
Number of cases.....	154
Average days in hospital.....	13.41
Deaths (3.24%).....	5
Complications	
Wound infections.....	12
Residual abscesses.....	3
Deaths: Four due to general peritonitis and one due to cellulitis extending from the incisional wound.	

GROUP C. Acute appendicitis with localized abscess. In the drained cases the abscess cavity was evacuated by suction and moist gauze, and the abdomen closed with the application of liquid paraffin.

With drainage	
Number of cases.....	54
Average days in hospital.....	24.33
Deaths (1.85%).....	1
Complications	
Wound infections.....	5
Secondary abscesses.....	2
Death: A man, aged 37, who died the sixth day postoperatively with paralytic ileus complicated by bronchopneumonia.	
Without drainage	
Number of cases.....	21
Average days in hospital.....	22.9
Deaths	0
Complications	
Wound infections.....	2

There is very little difference in the figures covering the group of cases of acute appendicitis with localized abscess except that complications were more common in the drained group and there was one death.

Summary.—The mortality rate in most series of appendicitis cases drained or undrained usually is about 3 per cent, while the rate is about 11 per cent in the drained cases. Many factors enter into deductions made from analyses of series but cases treated by non-drainage seem to have lower morbidity and mortality rates. Much may depend upon the surgeon alone.

Complications of Drainage

Tenopyr and Shafiroff³³ state in answer to the question of the dangers following drainage in patients who recover, that the incidence of intestinal obstruction, herniation, adhesions and fistula formation is very much the penalty for the use of drains.

Mensing,²³ Sperling and Wangenstein,³⁰ and others^{2,6,7,13,14,19,24,25,26,29,32,35} also feel that the insertion of drains leads to more complications and longer convalescences than non-drainage.

Ford Eastman¹³ feels that incisional hernias are due to cellulitis slough of important abdominal fascia and to muscular atrophy from disuse dependent upon long suppuration.

Breitmann³ considers it very erroneous to apply drainage and tampons at the spot of intestinal sutures because of the danger of fistula formation, or in proximity of blood vessels, as there is danger of necrosis of the walls, leading to bleeding. Proximity of drainage tubes to the walls of the intestines may cause perforation.

Mueller²⁴ says that abscess formation cannot always be avoided by the insertion of a drainage tube into the pouch of Douglas. He is certain that primary closure of the abdominal wall is well suited to make the disease picture milder, as well as to shorten the duration of healing.

Bancroft² obtained results as shown in the accompanying table, in comparing the complications in eighty-seven drained and eighty-seven non-drained cases.

Glascok¹⁶ noted that 50 per cent of his ruptured non-drained cases presented wound infections and he expressed the opinion that it might be advisable to drain the wound down to the peritoneum. Every drained case left the hospital with a discharging wound. In the non-drained

SURGICAL DRAINAGE OF THE ABDOMEN—GLABE

	Drained		Not drained	
	No.	Per cent	No.	Per cent
Infected wounds	12	10.5	3	2.6
Hematomata	2	1.6	9	7.8
Secondary abdominal abscesses	5	4.6	1	0.8
Intestinal obstruction	1	0.8	1	0.8
Paralytic ileus	2	1.6	0	0.0
Fecal fistula	3	2.6	0	0.0

ruptured group, when no infection occurred, the patient's temperature became normal on the third or fourth day, as compared with the twelfth or thirteenth day for the group that was drained. He considered this to be an accurate indication of the ability of the peritoneum to take care of itself after the source of infection had been removed and felt it supplied further evidence that the drain acts as an offending agent. In his series, the earlier the drain was removed the more readily the temperature returned to normal. The cases which were drained had a hospital stay of about four and one-half days longer than the non-drained cases. Although no fecal fistulae developed in the non-drained group, four occurred in the drained series, three of them in the gangrenous non-ruptured cases. He felt that this latter type of patient should be treated as a simple acute appendicitis not necessitating drainage.

Straus and Tomarkin³² studied 1,325 consecutive cases of acute appendicitis in relationship to

drainage. Their cases were treated in three different ways—abdominal drainage, subfascial drainage, and non-drainage. The non-drained group had an average hospital stay much shorter than the drained groups.

Non-drainage group10.7 days
Subfascial drainage group.....15.3 days
Abdominal drainage group.....15.6 days

Probably delayed healing of the abdominal walls was the only factor in prolonging hospitalization. Of the 1,325 cases, 462 had abdominal drainage, 794 no drainage and 69 had subfascial drainage—863 cases, therefore, in which there was no abdominal drainage. The mortality rate of the abdominally drained group was 8.03 per cent in comparison to 2.21 per cent in the non-drained group. They realized that their more severe cases were drained.

There were 187 patients with ruptured appendices, twenty of whom died. Of the 187, 110 were drained intra-abdominally. Sixteen deaths occurred in this group, a mortality percentage of 14.5. Twenty-five cases were drained subfascially and fifty-two had no drainage—a total of seventy-seven without peritoneal drainage. The four deaths made the mortality percentage 5.2. Thirty-one of the 187 patients had drainage alone at operation. Six of these patients, or 19.3 per cent, died. The average duration of symptoms before operation was 7.9 days.

The following summarizes the complications:

Abdomen drained			Abdomen not drained					
	No.	Per cent	No.	Total Per cent	No.	No drainage Per cent	Subfascial Drainage No.	Per cent
Pelvic abscess	33	7.1	21	2.4	10	1.2	11	15.9
Wound infection	462	100.	197	22.8	128	16.18	69	100.
Fecal fistula	16	3.4	5	.57	4	.5	1	1.4
Intestinal obstruction	4	.86	2	.2	2	.25	0	
Paralytic ileus	5	1.08	4	.46	3	.38	1	1.4
Generalized peritonitis	5	1.08	11	1.2	11	1.38	0	
Lobar pneumonia	10	2.1	6	.6	6	.7	0	
Bronchopneumonia	15	3.2	8	.9	8	1.0	0	
Emboic death	2	.43	0		0		0	

They stated that every drained case might be considered a wound infection.

Exclusive of wound infections, there were 139 cases, or 30 per cent, complications in the drained group, while there were 108 in the non-drained group, or 12.5 per cent.

Summary.—Statistics such as those contributed by Bancroft, Cayford, Straus, and Tomarkin, and Glascock reveal the danger of drains in themselves because of their foreign body effects. These dangers or complications include possible intestinal obstruction, herniation, adhesions, fistula formation, rupture of blood vessels, embolism, infected wounds, secondary abscesses, paralytic ileus and pneumonia.

Summary

1. At present there is not an ideal drain available. Most drains do not well remove or absorb exudates and most are likely to produce damage to adjacent tissues.

2. Yates and Hertzler especially have experimentally shown the processes developing and ensuing after the insertion of drains or foreign bodies into the abdominal cavity. Drains are quite ineffective after four or six hours and are completely walled off in twenty-four hours.

3. Surgeons differ greatly as to their opinions regarding indications and necessities for drainage. All agree, however, that a chronic localized abscess necessitates drainage.

4. Factors such as duration of symptoms before operation, the virulence of the organisms, resistance of the patient, age of the patient, and the tendency of surgeons to drain their severest cases forbid making any dogmatic statements regarding drainage or non-drainage.

5. With cases controlled as well as possible, non-drained cases seem to have lower morbidity and mortality rates than drained cases.

6. What are probable complications of drainage is the greatest argument against the use of drains.

Conclusions

The literature is full of contradicting articles on the subject of drainage of the abdominal cavity, especially in relationship to appendicitis, probably because there are so many factors influencing any study restricted to this one aspect, but after reviewing the literature it seems that a diversion from Tait's dictum to that of Mayo's

"When in doubt, don't drain" is quite imperative. Probably two unbiased conclusions may be drawn:

1. Drainage is perhaps indicated in chronic localized abscess alone.

2. Primary closure of the abdomen makes the disease picture milder, as well as shortens the duration of convalescence.

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MANAGEMENT OF ACUTE ABDOMINAL EMERGENCIES*

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THE surgical treatment of acute abdominal emergencies is, without question, the most interesting and fascinating field in which the general surgeon may delve. For its proper execution the surgeon is required to have not only technical skill, but also mature judgment coupled with a background of conservatism. Surely we cannot all hope to be blessed with all three of these attributes, but it is very easy for all of us to assume the last, namely, conservatism. In dealing with these emergencies, we should remember first and foremost that we are usually conducting a lifesaving operation and that the emphasis should be on this rather than on those factors associated with elective operation. Thus, the prime motive of the operation is to save the patient's life and the operation should be so conducted that this end is achieved. After the emergency situation has been controlled by a conservative procedure, one can direct his attention to the diseased organ and, if necessary, a second operation correcting the pathologic condition can be performed with a greatly decreased risk over attempting to cope with both at the same time. Such an attitude of conservatism can do much toward lowering the mortality accompanying acute abdominal operation. In this paper I shall discuss the surgical treatment of five of the more common acute surgical conditions arising in the abdomen.

Acutely Perforated Peptic Ulcer

The results at The Mayo Clinic and elsewhere definitely bear out the advisability of conservative surgical procedures in the management of acutely perforated peptic ulcer. The more radical procedures, such as gastro-enterostomy, pyloroplasty or resection, are accompanied by twice the mortality of simple closure followed by reinforcement of the region with omentum, which is, as a rule, the advisable procedure. In the

presence of marked scarring and a history of pyloric obstruction, if the perforation is of short duration and the patient's condition warrants a more lengthy procedure, gastro-enterostomy, pyloroplasty or gastroduodenostomy may be considered. Because of the marked inflammation usually present, any local procedure other than closure will be difficult technically. It is well to remember that few of these patients have had adequate medical management prior to perforation. Before subjecting them to the increased hazard of a long surgical procedure with the attendant danger of shock, a fair trial of conservative treatment seems judicious. Guthrie and Sharer have shown that simple closure of the ulcer results in 80 per cent cures and in only 20 per cent was there a recurrence of symptoms.

The anesthetic of choice is a combination of gas and ether. Because of the marked abdominal rigidity, relaxation is usually difficult and will require considerable ether to attain it. Spinal anesthesia is contraindicated because these patients are frequently in shock.

Most often the perforation will be easily discernible on the anterior wall of the first portion of the duodenum near the superior border. The sutures should be placed in the long axis of the duodenum so that when they are tied they will not tend to constrict the lumen. If the opening is too friable to close satisfactorily, the omentum or round ligament may be sutured over the area. One should always be on the lookout for multiple perforations.

If the perforation is closed within six or eight hours, probably in most instances drainage of the peritoneal cavity is not necessary if care is taken to evacuate the accumulated fluid with the mechanical sucker at the time of operation. If there is considerable fluid present or the perforation is of long duration, it is probably safer to drain, not only subhepatically, but also supra-

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pubically. I have never seen any ill effects following the use of the soft Penrose type of drain.

If the patient is first seen by the surgeon twenty-four hours or more after the onset and there is a tendency toward localization of the process, the best treatment may be conservative with the continuous nasal suction tube in the stomach. Under these circumstances operative interference might only add insult to injury by breaking open a closure which nature had already well effected.

Perforating malignant gastric lesions are occasionally encountered. Because of their nature, simple closure is technically impossible and resection is necessary with attendant high mortality. If perforation complicates malignant gastric lesions, it is usually subacute. If the condition is recognized it is best treated conservatively. Resection should be undertaken after the acute phase has subsided.

The mortality accompanying perforated peptic ulcer is in direct proportion to the time elapsed before surgical closure and to the magnitude of the operative procedure.

Acute Cholecystitis

At present there is considerable controversy over the management of the acutely inflamed gallbladder, some advocating immediate operation, others conservative treatment during the acute attack followed by operation after the acute symptoms have subsided. A few years ago only an occasional patient with clinically acute cholecystitis was operated on at The Mayo Clinic. Now, probably 50 per cent of the patients entering the hospitals as emergencies with a diagnosis of acute cholecystitis are operated on during the acute phase. The proponents of early operation advocate it for the following reasons:

1. Technically, it is easier because fibrinous adhesions are encountered rather than fibrous which are the rule later.

2. It does away with the danger of perforation into the stomach or duodenum or general peritoneal cavity with generalized peritonitis.

3. There is a lower mortality or morbidity.

On the other hand, the opponents of early operation give the following reasons for their attitude:

1. Technically, early operation is more difficult because of edema and bleeding. For this reason the common duct will be more frequently

injured and many patients will be subjected to cholecystostomy whereas if operation were postponed cholecystectomy could be safely undertaken.

2. Pathologic conditions of the common duct will be more frequently overlooked in early operation, because, often, icterus cannot be detected when the patient is first examined. If icterus becomes evident after operation, the surgeon will be in a quandary as to whether there are common duct stones or injury.

3. Rarely does generalized peritonitis result from acute cholecystitis.

4. Conservative treatment results in lower mortality and morbidity.

Personally, I have been pursuing a middle-of-the-road policy and have tried to individualize the treatment of acute cholecystitis. Those patients with considerable elevation of the temperature and pulse rate, accompanied by pronounced local findings, have been operated on immediately and usually cholecystectomy has been performed without difficulty. Occasionally the operation was difficult and rarely cholecystostomy proved the operative procedure of choice. On the other hand, the milder forms of cholecystitis have been treated conservatively during the acute attack and operated on in the interval at the patient's convenience. I am sure that the occasional operator will encounter more difficulty with early operation than later and, of necessity, will perform cholecystostomy where cholecystectomy could have been undertaken safely after the acute symptoms had subsided. In choosing between cholecystectomy and cholecystostomy, one should recall that the latter, more conservative procedure will relieve about 60 per cent of patients and only approximately 40 per cent will require further operation because of a recurrence of symptoms.

Acute and subacute pancreatitis are seen, usually accompanying acute cholecystitis. The milder forms can be diagnosed frequently by pain and tenderness in the left upper quadrant and by finding an elevated serum lipase. The more severe classic form is rarely diagnosed before exploration, because it is difficult to distinguish from the generalized peritonitis resulting from perforated peptic ulcer or a perforated appendix. If a definite preoperative diagnosis can be made, conservative treatment is in order, with explora-

tion of the gallbladder and ducts later, after the acute phase has subsided. If the diagnosis is made at exploration and the patient's condition is grave, drains should be placed down to the pancreas, getting out as quickly as possible. Of course, if the patient is in good condition, the needed corrective operation on the bile passages may be undertaken without undue risk. This will usually amount to exploration of the common duct with T tube drainage and cholecystostomy or cholecystectomy with adequate drainage over the region of the head of the pancreas.

Acute Intestinal Obstruction

When confronted with acute intestinal obstruction, one should determine first whether it is the large or the small intestine that is involved. Much abdominal distention with cramps and very little or no vomiting usually mean that the large intestine is involved; an annular carcinoma in the sigmoid is the most frequent cause. Often, conservative treatment, hot stupes to the abdomen and enemas in the knee-chest position, will be successful in relieving the acute phase of this type of obstruction. Duodenal drainage by means of the inlying nasal tube is rarely of any use in obstruction of the large intestine because the ileocecal valve permits very little fluid to back up through it into the ileum, even when the colon is much distended and there is considerable pressure in the cecum. Usually, one is safe in continuing conservative measures for twenty-four hours if the temperature and pulse are within normal limits. If there is no improvement at the end of this interval or if there is any tendency toward elevation of the pulse and temperature, one should undertake cecostomy immediately. This can be done satisfactorily under local anesthesia using a McBurney incision and the Witzel technic with a large No. 30 catheter. Exploration is not justified and a definite aseptic technic should be used, remembering that the fluid in the cecum is under terrific pressure. The patient will experience immediate relief and within twenty-four to forty-eight hours the abdomen is usually flat. It is not uncommon, after decompression has been effected, for the large bowel to regain its tonus and for the patient to empty his colon naturally. In ten days or so it is usually safe to attack the obstructing process directly.

On the other hand, if there is little distention with cramps and much vomiting, the small in-

testine is probably obstructed. The plain roentgenogram of the abdomen is of inestimable value, not only in helping to locate the obstruction in the large or small intestine by the pattern of the contained gas and fluid, but also in determining the efficiency of any type of therapy. For this reason, daily roentgenograms should be made. If the obstruction is of short duration with normal temperature and pulse and there is no evidence of strangulation as evidenced by rebound tenderness, one is justified in trying to decompress the intestine with duodenal drainage by means of the inlying nasal catheter.

If there is no definite improvement within twenty-four hours as evidenced by both roentgenographic and physical examination, or if there is a rise in temperature or pulse rate or a suspicion of strangulation, exploration should be undertaken without hesitation. On opening the peritoneal cavity, serous fluid usually escapes and if it is serosanguineous, one should look out for strangulation. In any acute obstruction involving the small intestine, unless it is known to be of an inflammatory nature, I believe that gentle exploration is advisable to rule out definitely strangulation or a closed loop type of obstruction. If an adhesion is found to be the cause, this may be severed and usually a Witzel type of enterostomy is advisable in the dilated intestine above the obstruction. A No. 16 or 18 catheter is large enough. If a strangulated loop is found and the patient's condition is good, one may proceed with resection and immediate anastomosis with temporary enterostomy above the anastomosis. On the other hand, if the patient's condition is critical, one should be satisfied with enterostomy and exteriorization of the strangulated loop, re-establishing the intestinal continuity later when the patient's condition has improved.

Adynamic ileus is characterized by marked distention, vomiting and absence of both peristalsis and cramps. This type is most often seen post-operatively. It is in this type of disorder, as well as obstruction of the small intestine due to inflammatory processes, peritonitis, and so forth, that the various forms of nasal tube decompression have proved successful in my experience. Rarely will duodenal drainage or the Miller-Abbott tube aid in relieving obstructions of the large bowel. Wangenstein, in popularizing duodenal drainage, pointed out its indications and contraindications, but in the enthusiasm for it

there has been a tendency to use it blindly in all obstructions and to rely on it too long before intervening surgically. In dealing with any type of intestinal obstruction the administration of barium by mouth is contraindicated and a dangerous practice. Transfusions and fluids by vein are frequently lifesaving measures in intestinal obstruction.

Strangulated Hernia

The mortality accompanying repair of strangulated hernia is in the neighborhood of 10 per cent as compared with 0.3 per cent in uncomplicated cases of inguinal hernia (latter figure from The Mayo Clinic during 1937 and 1938). Thus, the best treatment for strangulated hernia is prophylactic and for this reason one should not hesitate to advise early repair of all hernias, no matter how insignificant they may seem at the time of examination, provided that the patient is a reasonable operative risk. In dealing with strangulated hernia, the prime motive of the operation is to relieve the intestinal obstruction and to determine the viability of the strangulated loop. Repair of the hernia is of secondary importance and one should not jeopardize the patient's chance of recovery by prolonging the procedure until a satisfactory closure is effected. If the patient is in a grave condition and has a gangrenous loop of intestine, operation should consist only in the exteriorization of the involved portion of the intestine, thus allowing drainage and relief of the obstruction. At a later date, intestinal continuity may be re-established when the patient's condition is improved and the hernia may be repaired without undue risk.

Appendicitis

There is no question about the proper treatment of early acute appendicitis prior to perforation, but there is a great deal of controversy as to the proper procedure in the face of perforation and its complications. If signs of localization are not present in the face of a perforated appendix with generalized peritonitis, I feel the proper procedure is immediate operation with drainage of the peritoneal cavity. If the patient's condition warrants appendectomy and if it can be accomplished without trauma or spread of infection owing to the breaking down of protective adhesions, appendectomy is permissible. Rarely, a patient will be admitted in such poor condition that any operative procedure

would be attended by great risk. Under these circumstances, conservative treatment is indicated during which an attempt is made to rehabilitate the patient and to determine what method of management will be best for that type of case.

If, on the other hand, there are signs of localization of the inflammatory process, conservative treatment is instituted under close observation until the seventh or eighth day after perforation at which time the patient has greatest immunity to the infection. At this time the abscess is drained unless, as will occasionally happen, there is resorption of the inflammatory mass. Again, in this case, an attempt should not be made to remove the appendix unless it is free in the abscess cavity and can be removed without breaking down protective adhesions. If appendectomy has not been accomplished, the patient is advised to return for it in two to three months, unless acute symptoms ensue during this period; if such occur, operation, of course, is undertaken immediately, to obviate the occurrence of a second perforation.

All patients with peritonitis, whether operated on or treated conservatively, are handled in essentially the same way. Nothing is administered by mouth until flatus is passing per rectum and distention is relieved. If there is vomiting, continuous duodenal drainage is instituted. Fluids are administered subcutaneously and by vein. Personally, I feel that small transfusions of 250 to 300 c.c. of blood with oxygen therapy by mask or by tent, are the most potent weapons in treating peritonitis. Simple elevation by placing 10 inch blocks under the head of the patient's bed is just as efficient as the use of Fowler's springs, more comfortable for the patient and easier from the standpoint of nursing. Morphine is administered in adequate doses every three to four hours. Enemas and proctoclysis are avoided. A rectal tube is inserted for a few minutes every four hours. If abdominal distention is present, hot turpentine stupes are in order. Priestley^{4,5} has shown that Weinberg's serum is of definite aid in the treatment of peritonitis secondary to a perforated appendix.

The Use of the Sedimentation Rate in Diagnosis

The research that Bannick and his collaborators² undertook at The Mayo Clinic a few years ago in regard to the sedimentation rate of the

red blood cells in acute abdominal disease has done much toward clarifying the position that should be occupied by this valuable test in the differential diagnosis of acute abdominal conditions and has pointed the way to the prominent part this simple laboratory procedure will undoubtedly play in the future. Bannick found, after close observation in a number of cases in which the diagnosis was substantiated either by operation or bacteriologically, that:

1. The sedimentation rate is normal in acute simple appendicitis, but after rupture, with either localized or generalized peritonitis or abscess, the rate becomes elevated. It is readily seen how this test, which will give definite information as to the presence or absence of perforation, will be of unlimited value in the surgical management of acute appendicitis.

2. Occasionally, in cases of acute pelvic inflammatory disease, the sedimentation rate will be within normal limits during the first forty-eight hours after the onset of abdominal pain. Beyond this time it is invariably elevated. This finding shows that one must not rely on a normal sedimentation rate in distinguishing appendicitis and acute pelvic disease within the time limit stated.

3. In acute cholecystitis and acute infections of the urinary tract, the sedimentation rate was usually elevated, even early in the disease, but not invariably so.

Bannick¹ hastened to caution that the sedimentation rate, although more trustworthy than

the white blood count, is not infallible and certainly should take second place to a careful history and physical examination.

Summary

Emergency operations are usually lifesaving procedures and the surgeon should choose the most conservative procedure available which is compatible with the problem at hand. Corrective operation can frequently be advantageously delayed until the patient has recovered from the emergency lifesaving operation with less risk to the patient and a better probability of carrying out a complete and curative procedure. This is especially true in acutely perforated peptic ulcer and acute intestinal obstruction. It also holds in the severe grades of acute cholecystitis, acute appendicitis and strangulated hernia.

The sedimentation rate is of definite value in the differential diagnosis of acute abdominal diseases.

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THE TREATMENT OF MENTAL DEFECTIVES IN MINNESOTA*

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THE experience of years has changed the original idea that the purpose of state institutions for the care and treatment of mental defectives is to provide segregation for life, although this is still necessary for the majority of those committed who are idiots or imbeciles. Idiots are individuals with intelligence quotients up to 24 per cent (Kuhlmann scale) and mental ages up to two years; imbeciles are those with intelligence quotients from 25 to 49 per cent and mental

ages from three to six years. However, with the more frequent recognition of the high grade mental defectives or morons with mental ages from seven to eleven years and intelligence quotients from 50 to 74 per cent, larger numbers of this type are, because of associated social problems, being admitted to the institutions for feeble-minded. Unfortunately, the public usually understands that the term moron describes a person guilty of some terrible sex crime. This may be because the lay press tends to refer to such perpetrators as morons. These crimes, usually,

*Read at the annual meeting of the Minnesota State Medical Association May 31, 1939.

however, are not committed by feeble-minded persons but by individuals with psychopathic personalities requiring treatment and control different from that needed by mental defectives.

Many of the moron group can return to their communities to be entirely or partly self-supporting under supervision. This is highly desirable both for humanitarian and economic reasons. Expanded and improved school departments have increased the number of these children who may have the benefit of proper treatment in state institutions through shortening the average time spent there for training. For this reason, each child is carefully studied to determine the amount of academic work that should be taught. The type of vocational training to be given is determined in part by the special aptitude present and in part by whether the individual will return to a rural or urban community. Special attention is given to recognize and correct improper habits and emotional reactions. The educational and recreational programs are planned to try to develop a proper social adjustment.

The new arrival sent to our institution by the Board of Control* after commitment enters first the hospital for fourteen days of isolation to prevent the spread of contagious diseases. During this time, routine physical, neurological, and psychiatric examinations are made as well as laboratory studies of the blood, urine, smears from the nose and throat, the blood Wassermann test, the Mantoux test, an x-ray of the lungs to prove the presence or absence of active tuberculosis, as well as spinal fluid examinations, when indicated. Those unprotected against smallpox are vaccinated upon arrival. Each case is reviewed by the physician in charge with the entire medical staff at the weekly medical rounds and agreement is reached as to the cause and diagnosis of the mental defect present, and of the treatment of physical disabilities present. When necessary, arrangements are made for consultation with specialists in various fields. A full-time dentist checks the condition of the teeth of each child upon admission and takes care of dental needs while in the institution. Special attention is given to provide an adequate and

well-balanced diet, together with special diets when required.

Each week a general Staff Case Conference occurs at which are present the resident physicians, the principal of the school department, the social service workers, and the dormitory division supervisors, with the superintendent presiding. Each new arrival is presented in person with medical, social, and school histories, except for low grades who are cleared by record only. It is determined to which dormitory the child will be assigned; the type of formal training, if any, to be given; or the kind of institutional work to be assigned if training is not necessary or desirable. The newly admitted fall into one of six classes:

1. For segregation, low grade defectives and those seriously crippled. These require continuous nursing care.
2. For segregation, low grade defectives able to do some type of institution work.
3. For segregation, chronic delinquents who are assigned to special locked buildings for each sex.
4. For sterilization and immediate return to the community.
5. Defective delinquent girls transferred for sterilization from the State School for Delinquent Girls at Sauk Center.
6. Those desirable for placement after completing period of training.

The last group is referred to the School Department. On April 25, 1939, this consisted of:

I. *Teachers:*

One principal and an assistant.
One librarian.
One teacher of music and one bandmaster.
Six pre-vocational or manual arts teachers.
Six industrial teachers.
Eight academic teachers.
Two physical education teachers.

II. *Rooms:*

Sixteen in the school building.
Six industrial rooms in other buildings.

III. *Children:*

213 children in the academic department with intelligence quotients above 50 per cent and between six and eighteen years of age.
75 boys in industrial departments, with intelligence quotients from 30 to 50 per cent and between six and eighteen years of age.
99 girls in industrial departments, with intelligence quotients from 30 to 50 per cent and from six to eighteen years of age.

*The Board of Control has been replaced by the Department of Social Security which consists of the Divisions of Employment and Security, Social Welfare, and Public Institutions, as created by the Reorganization Act which was passed by the last legislature. Feeble-minded persons are committed to the guardianship of the Director of Social Welfare, and the School for Feeble-Minded is operated under the supervision of the Director of Public Institutions.

83 boys in vocational shops and dairy with intelligence quotients above 45 per cent and from seventeen to forty years old.

29 girls in vocational departments with intelligence quotients above 45 per cent and from seventeen to forty years old.

The School Department reports to the Case Conference the record of each child as soon as training is completed to determine whether community placement is desirable. Favorable action occurs only if the individual is considered likely to possess all the qualities necessary to maintain himself in whole or in part under local supervision. If approval occurs, the County Welfare Board is so informed, together with a statement of the appearance, physical condition, training and proficiency, habits, and emotional stability of the individual with the recommendation that plans for placement be undertaken. Placement is recommended by the Case Conference if the members approve the plans submitted. The person is discharged from the institution when authorization is received from the Board of Control, and thereafter is under the permanent supervision of County Welfare Board. Ordinarily, a female in the child-bearing years, or a male, irrespective of age, is not paroled unless sterilized.

Group four, consisting of those admitted for sterilization and immediate return to the community, are represented by cases in which one or both mates in a family are sent to us for the purpose of sterilization, upon the recommendation of the County Welfare Board. They return to their own homes after convalescence. A case in this group is that of a man thirty-two years old whose intelligence quotient was 43. He had lived all his life on a farm and had good habits. All the members of his family were subnormal and depended upon him to do most of the work. When his County Welfare Board learned that he had married, steps were taken to have him committed as feeble-minded and a few days after his marriage he agreed to enter our institution immediately to be sterilized and was then paroled to his home. Another one of this group was a mother, thirty-nine years of age, with an intelligence quotient of 59, who was sent to our hospital during the past year to be confined and who had consented to sterilization thereafter. She gave birth to her fifteenth child, of whom all but one were living. It had been determined before she was sent to us that three

of her children were morons, one was dull-normal, and the others had not had a psychometric examination. Five of them were of pre-school age and the attendance of the others at school was intermittent because of the laxity of the parents. The two eldest daughters became illegitimately pregnant at the ages of fifteen and seventeen years respectively, and one of them has been committed as feeble-minded. During the year 1938, twenty-four women, after commitment, were admitted for confinement with the possibility of sterilization if a plan for their return to the community were approved. For seventeen of this group such a procedure is evolving or has been completed. Nine of the twenty-four are unmarried mothers, nine are married and already have families which exhibit degrees of mental defect, while six have been married, and are not living with their husbands—the last child being illegitimate.

The fifth group is made up of girls transferred to us from the State School for Delinquent Girls at Sauk Center. This institution is not one planned for the care of feeble-minded but some are found to be mentally defective after admission and these are committed to the custody of the State Board of Control. However, because of our lack of space, their training is completed at Sauk Center and those considered suitable for placement are sent to us for sterilization. This group will be transferred to an institution for feeble-minded immediately after commitment when sufficient space is provided.

Last August a questionnaire was sent to the County Welfare Boards relative to those on parole from our institution to determine how well they were adjusting to community life. Of 1,190 sent, 906 responses were received, of which 765 referred to females and 141 to males. The data have not been completely tabulated but the reports leave a favorable impression and justify the efforts to return desirable, trained mental defectives to life outside the institution under proper supervision. A study made in Hennepin County March 31, 1939, of individuals on parole from the institution, showed that there were at the time, 102 of 140 females, and 29 of 49 males, employed under the supervision of the County Welfare Board.

Since 1921 our institution has shared with the state in the splendid work done by Dr. F. Kuhlmann as Director of the Division of Examina-

MENTAL DEFECTIVES IN MINNESOTA—ENGBERG

ADMISSIONS

	Moron		Imbecile		Idiot		Total	
	M	F	M	F	M	F	M	F
New admissions	93	151	40	38	25	14	158	203
	244		78		39		361	
Readmissions	24	25	9	3	2	6	35	28
	49		12		2		63	
Total	117	176	49	41	27	14		
	293		90		41			
Infants born or admitted here with mother for nursing care. Returned to county of residence at three months of age.							13	15
							28	
Grand Total							206	246
							452	

tion and Classification of the State Board of Control. All the mental testing done in our institution has been under his direction and all questionable cases have been referred to him for a recommendation as to disposition. Those determined not to be feeble-minded are discharged as soon as other plans have been made for them. Dr. Kuhlmann has been responsible, also, for the broad testing program conducted in all counties of the state. On March 1, 1939, tests showing intelligence quotients of less than 75 per cent had been given to 25,137 persons on an individual basis since 1923 and, during this period 7,256 committed to state guardianship as feeble-minded. However, on that date there was of record a total of 9,144 mentally defective persons receiving some kind of care, treatment, supervision or training at public expense. They were distributed as follows:

- 2510—in the School for Feeble-Minded.
- 493—in other institutions, committed.
- 1450—satisfactorily adjusted outside but committed.
- 1194—committed, awaiting institutionalization.
- 3497—in special classes. This is an estimate. It is the number of children enrolled in forty cities and towns conducting special classes for subnormal children during this school year 1937-1938. Very few of these are committed as feeble-minded.

ANALYSIS OF DISCHARGES For the Calendar Year 1938

	Males		Females		Total
	Ster.	Not Ster.	Ster.	Not Ster.	
To county supervision after period of institutionalization	12	5	32	8	57
To county supervision after sterilization only	17		35		52
Supervision of Lynnhurst Club, Saint Paul			24		24
To county other than that of residence (Farm placement)	7				7
To county after confinement and sterilization			15		15
Transferred to other institutions	3	27	3	6	39
Infants returned when three months old to county after birth here or after providing nursing care only, when admitted with mother		13		14	27
Supervision of home school			6	1	7
Escapes		11	6	4	21
Deaths		31	1	12	44
Totals	39	87	122	45	293
	126		167		

The total of 9,144 given above does not include any of the 932 patients in the Colony of Epileptics at Cambridge. The majority of these are mentally defective in addition to suffering from epilepsy, and properly increase the known total of mental defectives in the state to about 10,076.

Annual commitments are now in excess of 700 per year, and the waiting list of 1,200 is already so large that from three to five years elapses after commitment before space becomes available at Faribault. This unfortunate condition

will now become noticeably worse until space at another institution is provided, as in the past two years we have been able to increase our capacity to its maximum. This is shown by the record of inmates in the institution as of April 29 as follows: 2,245 in 1934; 2,263 in 1935; 2,274 in 1936; 2,261 in 1937; 2,373 in 1938; and 2,537 in 1939. Hereafter, new admissions will have to be limited, however, to the number discharged from the institution. Those on the waiting lists will be the problems of the local counties and many of them it will be almost impossible to handle in the community, especially the low grade hyperactive, destructive, or untidy children; or those with bad sex habits in families with other children; and the high grade mental defectives with delinquent tendencies. Arrangements are made by the County Welfare Boards for the unmarried to live with families in boarding homes, or in private institutions of various kinds; while some of the married ones, instead, may be supervised in their own homes—sometimes with their children.

The accompanying tables are presented to show the movements of the population at the Faribault Institution for Feeble-Minded in the calendar year 1938.

The above admissions and discharges occurred during a year in which our average daily population was 2,349 (females 1,126; males 1,223)

and is representative of what will probably be the record in the future except for the reduced number of new admissions.

In closing, it is proper to repeat that although state institutions still play a necessary part, they cannot solve the entire problem of the care and treatment of mental defectives. In other words, the solution is not as simple as merely the commitment to an institution. Rather, the problem is so great that we must plan for reasonable control, rather than for complete solution. This requires the combined, coördinated efforts of the local communities, schools, courts, local county welfare boards, institutions, and the state department. It is essential that physicians in local communities recognize the condition when encountered in practice so that they may personally, or through reference to qualified specialists, give proper advice to the patient's family or welfare agencies and also, when necessary, to properly meet the legal requirements for possible commitment. To diagnose and recognize the needs for low grade mental defectives is not difficult, but to do the same for morons requires a thorough knowledge of this group. The failure to recognize all mental defectives presenting social problems and the failure or delay in establishing proper control of them results in great expense, unhappiness, and suffering.

PRESENT-DAY TREATMENT OF UNUNITED FRACTURES OF THE NECK OF THE FEMUR*

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UNUNITED fractures of the neck of the femur are more commonly encountered among elderly women than among elderly men. Many of the patients manage to get along well enough to meet the economic and social demands made on people of their age, and if so, surgical measures need not be considered.

Selection of Patients for Surgical Operation

If disability and pain, further complicated by social and economic conditions, make life un-

happy, surgical interference may be deemed advisable. The surgeon, however, must be convinced, first of all, that the patient's life expectancy warrants the time and money to be expended by the patient. The surgeon must be sure, also, that the operative risk as to life, infection and so on, is justifiable. Organic heart disease, such as myocarditis and involvement of the coronary arteries, are distinct contraindications to operation, and obesity, if it is at all marked, is an unfavorable factor. Very rarely should a patient who is more than sixty-five years of age be operated upon for an ununited fracture of the hip.

*From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota.

Pathologic Changes in the Hip

The condition and contour of the head and neck of the femur are of extreme importance if surgical intervention is to be considered, and much is to be learned from careful roentgenologic study. If a great deal of the neck of the femur has been absorbed, and if there is great laxity at the site of fracture, the probabilities are that little, if any, fibrous union is present. An idea as to the degree of laxity can be gained by measuring the distance from the anterior superior spine of the ilium to the internal malleolus: first, while the leg is strongly pulled and, second, while a strong push is exerted upward, with the knee held fully extended, and then noting the difference in measurements. Roentgenograms made while the same forces are exerted confirm whether there is much laxity.

The distinction between fibrous union and true nonunion (pseudarthrosis) is important.

Roentgenologic examination gives much valuable information. The degree of absorption of the femoral neck can be determined if the film is made with the foot held upright, or even rotated a bit medially. If the head of the femur casts a dense shadow, the chances are that it is necrotic; if it appears osteoporotic, the chances are that it is viable. In doubtful cases, it is only on exploration of the joint that the exact condition can be ascertained and, even then, it is not always easy to determine definitely the viability of the head.

Types of Operation

An ununited fracture of the neck of the femur causes disability because of lack of skeletal support; the strain of weight-bearing is borne by ligaments and muscles. In a few unusual cases, in which the patients were younger men, I have seen fibrous union become so firm that they could carry on their activities, even at hard labor. Therefore, the prime object of all surgical procedures is to provide skeletal support if the fibrous union is too weak. Sometimes, by waiting several years, the fibrous union becomes strong enough for the patient to get about with a cane. The question of whether to operate is to be decided by the surgeon and the patient in each individual case; definite rules cannot be laid down.

A number of surgical procedures may be used. Such operations are not common and members of the medical profession at large are not as familiar with them as they are with operations for

more common conditions. The first aim in repairing any fracture, recent or old, is to restore the parts as nearly as possible to their normal anatomic condition and to restore to the part its normal physiologic action. In general, there are three headings under which surgical operations for ununited fractures of the neck of the femur can be discussed: (1) anatomic restitution, which gives the best chance of physiologic recovery, (2) furnishing of skeletal support, with retention of as much motion as possible, and (3) obliteration of all function except weight-bearing, motion being eliminated by arthrodesis. The different operations will be discussed according to this classification.

Anatomic Restitution

Operations under this heading aim to save the head of the femur and induce it to unite either with the neck of the femur or with the remodeled upper end of the femur. Motion of the joint is preserved.

Autogenous Bone Graft.—Use of the autogenous bone graft has been advocated for many years, and, in properly selected cases, has brought about many brilliant results. It should be attempted only by those who possess the necessary advantages as to proper hospital facilities, instruments and skill. It can be performed in one of two ways: by the open method (articular osteosynthesis), or by the closed method (extra-articular osteosynthesis).

The open method demands wide exposure of the joint, careful dissection of all fibrous material from between the fragments and meticulous freshening and fitting together of the surface of the fracture. It is especially suited for younger patients who are in excellent general condition. I have traced sixty-seven of seventy-seven patients in whom an autogenous bone graft was used for an ununited fracture of the neck of the femur. This study covered the period of twenty-six years from July, 1913, to June, 1939, inclusive. It is apparent that these operations are not commonly performed. Bony union was obtained in 69 per cent of cases, whereas in 31 per cent the operation resulted in failure (Fig. 1).

The so-called closed, or blind, method of insertion of the graft has come into prominence in recent years and has the definite advantage that the operation is performed without opening the joint. Therefore, there is much less danger to

the patient from shock and other untoward events. Before this type of operation is undertaken, all shortening must be overcome by either skeletal or skin traction and the roentgenogram

reamer used is a little smaller than the diameter of the fibula. The reamers are threaded on the wire and therefore cannot deviate from the proper direction. The guide wire must be placed deep in



Fig. 1. Bone graft eleven years after insertion for ununited fracture of the neck of the femur (intra-articular osteosynthesis). Firm union; excellent function.



Fig. 2. Solid, bony union with normal function obtained after extra-articular osteosynthesis (fibula). The patient was a woman, sixty-seven years of age, with nonunion of the neck of the femur of one year's duration.

must show that the femoral head and neck are in normal alignment. With this condition of shortening overcome, the bone graft can then be inserted so that, after the operation, it is not subject to any undue stress or strain, the fragments being locked firmly together and the leg put up in abduction so that the position is maintained and the bone graft merely acts to steady it.

Our experience with this method has been encouraging, and I believe that in carefully selected cases it can be used. For this reason, I shall describe the procedure in further detail.

The fibula furnishes excellent material for insertion by the "closed" method, and a full segment of definite length of the bone can be removed, without functional damage, from the middle third of the leg. With the patient on the fracture table, a small, longitudinal incision is made laterally over the trochanter and extends downward for a short distance over the shaft of the femur. A Kirschner wire then is inserted through the trochanter, through the remnant of the femoral neck and well into the head. To be certain that the wire has been properly centered, its position is verified by anteroposterior and lateral roentgenograms. With the wire satisfactorily placed, three cannulated reamers of different sizes are used in series to prepare a channel for reception of the piece of fibula; the last

the head, even penetrating into the acetabulum, or it will loosen and pull out as the reamers are withdrawn. The piece of fibula is slid along the Kirschner wire, and pounded in. One important step in preparing the piece of fibula is the stripping of the muscles and the thorough roughening of the cortex by aid of a chisel, thus producing a roughened and freshened surface and so facilitating the entrance of blood vessels into the graft, furthering its nutrition (Fig. 2).

If the condition is true pseudarthrosis, that is, if there is no fibrous union, this method of blind insertion of the graft, without freshening of the fragments, will probably fail. It is known that the driving of an autogenous bone graft across joint surfaces will not lead to ankylosis because the bone graft will not receive any nourishment where it traverses the joint space and will weaken and fracture there.

Metal Nail for Fixation.—Another method is to open the joint, freshen the surfaces of the fragments and hold them in apposition by pinning them together with a Smith-Petersen nail. There have been no reports, so far as I know, of any sizeable series of patients treated by this method. However, it is reasonable to assume that with good technic and careful fitting of the fragments, good results might be the rule, if the femoral head is not necrotic.

Brackett Operation.—The Brackett operation is a sound surgical procedure. It consists of complete exposure of the hip joint by lifting upward the trochanter and its attached muscles, removing any fibrous tissue between the fragments, freshening of the fracture surface of the head and remodeling of the upper end of the femur, which may mean entire removal of the remnant of the femoral neck in order to fit it accurately to the head. The trochanter, with its attached muscle that has been reflected upward, is brought down and fastened at a lower level on the shaft of the femur. This step is important because it restores normal tension of the muscles. The operation is best suited to younger individuals and the head of the femur must be viable (Fig. 3). It is a major surgical procedure and should not be undertaken if patients are old or debilitated.

Care Following Operations for Anatomic Restitution

Following operations of the types mentioned, namely, bone grafting, nailing or the Brackett operation, it is essential that firm and adequate postoperative fixation be maintained a sufficient length of time for bony union to develop. This cannot be expected to occur in less than three months. Such prolonged fixation may be a trial and burden for elderly and weak persons and entails long confinement in the hospital. The stiff knees so often encountered following prolonged fixation are further complications that greatly retard convalescence.

Reconstruction Procedures, the Objects of Which Are to Furnish Skeletal Support

If, because of a necrotic femoral head, advanced age, and so on, the more nearly ideal procedures that aim at anatomic restitution cannot be carried out, the aim has to be merely to restore skeletal support and to save as much motion as possible.

Whitman Operation.—Royal Whitman, famed for his advocacy of the closed treatment of fresh fractures of the neck of the femur, later described a reconstruction operation since known by his name, for nonunion of the neck of the femur. The essential points of the operation are removal of the head of the femur, remodeling of the upper end of the femur, which is then placed in the acetabulum, and moving the trochanter, with its attached muscles, to a lower level on the shaft of the femur (Fig. 4).

Colonna Operation.—Paul Colonna has developed a procedure somewhat similar to that of Whitman in that the head of the femur is removed and also the remnant of the neck. Colonna carefully strips the trochanteric muscles from the trochanter, gathering them together by aid of a purse-string suture. The trochanter is placed in the acetabulum, with the hip in abduction, and the reflected muscles are fastened, by aid of the purse-string suture, through a hole bored through the shaft at a lower level, thus keeping the gluteal muscles under normal tension (Fig. 5).

Albee Operation.—Albee has advocated a reconstruction operation wherein the head of the femur is removed also, but, in addition, perpendicular osteotomy, from downward, at the junction of the neck and the trochanter, is performed and the outer fragment, with the trochanter and its muscles, is pried outward. He then puts the upper end of the femur in the acetabulum and, in order to hold the trochanter and its muscles outward, inserts in the cleft left by the osteotomy such an amount of the head of the femur as is necessary to maintain the fragment in its lateral position. The object of this last step is to provide leverage for the trochanteric muscles.

Care Following the Whitman, Colonna and Albee Operations

Postoperative fixation is extremely important for the success of any one of these reconstruction procedures. The hip must be maintained in a well abducted position long enough to insure reattachment of the muscles to the femur, so that they can institute motion of the reconstructed joint when the cast is removed. This position should be held from three to four weeks, but flexion of the hip may be passively carried out and thus the knee exercised as early as two weeks after operation. The institution of motion of the knee as early as possible is greatly to be desired and definitely shortens convalescence. These operations give bony stability but many of the patients are forced to resort to the aid of a cane or crutch in walking any great distance. However, on the whole, the results are satisfactory and well worthwhile.

Other Procedures that Furnish Skeletal Support

High Osteotomy.—Of recent years, it has been argued that if the line of weight-bearing could be altered and the lower fragment brought well

inward beneath the head, the shearing force, when weight-bearing is attempted, will be abolished. To this end, the high osteotomy, effected really between the greater and lesser trochanters,

is durable and in the main unsuitable for elderly patients, and, second, it is not easy really to obtain bony ankylosis in the elderly. It would seem that pain is the chief indication for its use, but usual-



Fig. 3. Result ten months after Brackett operation.



Fig. 4. Result three years after Whitman reconstruction operation.



Fig. 5. Skeletal weight-bearing accomplished by Colonna operation.

has been advocated strongly by McMurray of Liverpool. He has reported that function has been much improved and he has stated further that in many cases healing has progressed to bony union after this new line of weight-bearing has become established. I have had too little experience with this operation to express an opinion. More definite information no doubt will be at hand shortly, for the operation is being performed with increasing frequency in a number of clinics in America.

Low Osteotomy.—Lorenz, of Vienna, advocated low osteotomy, effected below the lesser trochanter, and placing of the upper end of the lower fragment in the acetabulum. He recommended this operation for irreducible congenital dislocation of the hip. Somewhat the same procedure has been advocated for ununited fracture of the hip. In such an operation the upper end of the lower fragment is placed just beneath the femoral head. I have had no experience with it.

Arthrodesis for Stability

If none of the aforementioned procedures is deemed advisable, if the patient is incapacitated seriously and perhaps is suffering with much pain, arthrodesis of the hip joint should be considered. However, a stiff hip is an awkward affair if the patient is elderly. Arthrodesis has been resorted to rarely in America for this condition, first, because it is a major surgical proce-

ly this can be controlled by limitation of activities.

Summary

Ununited fractures of the neck of the femur can be treated surgically if the patient is in good general condition and has an expectancy of life that warrants surgical measures.

The types of operation can be grouped under three headings: (1) those that aim at securing anatomic restitution, with bony union of the fragments, (2) those that aim, by the so-called reconstruction operations, to furnish skeletal support and still to allow motion, and (3) arthrodesis that aims to furnish only skeletal support with complete loss of motion.

No rules can be laid down as to what patients should be subjected to surgical measures or as to what type of operation should be employed. Each case must be considered individually and the decision made on the basis of the findings.

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SURGERY OF COMMON AND HEPATIC DUCT CALCULI*

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BILIARY surgery, like modern surgery in general, is of such relatively recent development that it is little wonder the biliary ducts have been slow to receive the attention they merit. The origin of attention is so recent as to be within the life span of some to whom today the problem is of everyday occurrence.

It was June 15, 1882, when Carl Langenbuch of Germany performed the first cholecystectomy. In 1887, Justus Ohage, Sr., once president of the Minnesota State Medical Association, first performed cholecystectomy in America. Although cholecystectomy is among the most frequently performed of abdominal procedures and usually is accomplished without difficulty, it may be one of the most difficult problems. When the ducts contain calculi the situation becomes more serious for the patient and technically more difficult for the surgeon.

Frequency of Ductal Calculi

The most common cause of recurrence of colic following cholecystectomy is choledocholithiasis. Lithiasis is the most common cause for secondary operations on the biliary tract, with stricture next in frequency. When cholecystectomy is performed without giving attention to the ductal system, calculi are being left in the ducts in from 10 to 20 per cent of the cases. Wilkie¹⁵ reported removing one or more calculi from the common duct in 18 per cent of 257 cases of cholelithiasis. Ravdin,¹¹ in a study of ninety-five cases of cholelithiasis, found ductal calculi in over 14 per cent. Lahey⁶ has estimated the average incidence at 20 per cent. Cutler² recently reviewed 397 operations for cholelithiasis performed between 1934 and 1938 at Peter Bent Brigham hospital. Common duct stones were found in 18.6 per cent of all cases, in 51 per cent of common ducts opened. There was no mortality in seventy-one cases, where the duct was opened and no stones were found.

The frequency with which calculi are found in the common or hepatic ducts, therefore, seems to be in direct proportion to the diligence and com-

petence of the surgical attention to the ductal system. Obviously, careful examination of the common duct should be a routine consideration in every operation on the biliary tract.

The first step in the prevention of recurrent colics following cholecystectomy, therefore, is the recognition and management of choledocholithiasis *at the original procedure*. The anatomy then is defined more clearly and the tissues dissected more easily. The problems in secondary operations on the common duct, often in anemic and jaundiced patients, are much more formidable. As shown in many studies, not only the common duct but the whole biliary tree and the interrelated organs must be considered in surgical treatment of the biliary system.^{5,7}

The following study is based on personal experience and a review of the surgery of ductal calculi at the Minneapolis General Hospital from January 1, 1928, to January 1, 1938, when 283 cholecystectomies for cholelithiasis were performed. The common duct was opened twenty-nine times and calculi were removed from the common and hepatic ducts in fourteen cases. The common duct was opened more freely in the latter half of the decade.

Diagnosis of Choledocholithiasis

It is recognized today that calculi may lie dormant in the ductal system for years. Symptoms follow sooner or later in most cases. Symptoms arising from common or hepatic duct calculi are those of cholecystic disease plus jaundice. If symptoms persist following a typical attack of biliary colic, disturbance in the ducts should be suspected.

Colic is the most common and characteristic symptom of choledocholithiasis. In this series of common duct calculi, colicky pain was present in 85 per cent of the cases. In 14 per cent the pain was dull and boring. In the largest recorded series,⁴ pain was absent entirely in 2.4 per cent of cases.

The most frequent cause of jaundice of all types is common duct calculus. Jaundice was present in 85 per cent of the patients in this series. Chills and fever were present in one out of

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three of the patients. Other gastro-intestinal disturbances were present in most cases. Nausea and vomiting were present in eleven of the fourteen cases in which calculi were removed from the common duct.

No one is infallible in the differential diagnosis of jaundice. A gallbladder may be distended in cases of choledocholithiasis and contracted in malignant obstruction. Colic may occur in cases of carcinoma and not infrequently is absent in cases of stone. Pylorospasm may be the only symptom of a common duct calculus. But a guess is a poor peg when the thread of a human life hangs on it. Exploration is therefore indicated in all cases of probable ductal obstruction where such examination can be carried out within reasonable risk.

Watson^{13,14} has been very successful in distinguishing calculous, cancerous, parenchymal, and hemolytic forms of jaundice by determining the excretion of urobilinogen in urine and feces.

If common duct obstruction is complete, the serum bilirubin will become fixed at from 20 to 30 milligrams for each 100 c.c. of blood, with the icterus index usually between 150 and 200 units. The jaundice of common duct calculi, however, is almost always intermittent. The intermittency of symptoms provides an excellent diagnostic clue. If a Rehfuß tube is passed three or four times, bile can almost always be recovered if obstruction is due to calculus.

Surgical Preparation

Operation is best performed when the serum bilirubin is normal, or tends to be on the decline, or is not increasing; and best not performed until after attempts to reduce prothrombin time. If the jaundice does not recede within two weeks, the common duct should be explored usually. Patients with deep jaundice of short duration are better risks than patients with less jaundice of long duration. Blood transfusions are helpful in reducing the incidence of hemorrhage and improving the patient's resistance. Of great value is the restoration of glycogen reserve in the liver.⁸

Increasing use of vitamin K substances and bile salts in cases with prothrombin deficiency has decreased considerably the need for blood transfusions in the control of the bleeding tendency.

Methods used for measuring bleeding tendency in a jaundiced patient still are far from perfect.

Quick's¹⁰ method for determining thromboplastic activity has proven useful clinically. Simpler and more practical for bedside use, especially in smaller hospitals, is a test recently developed by Ziffren and associates.^{16*}

Within recent months the structure of the vitamin K (from alfalfa) molecule has been found to be 2 ethyl-3 phytyl-1, 4-naphthaquinone and the compound has been synthesized. Other quinones have been found to have vitamin K activity.

At the present time it seems best to determine prothrombin clotting time in each patient with jaundice and give concentrates of vitamin K and bile salts prophylactically in each such patient before operation. If the prothrombin time is prolonged such concentrates and bile salts should be given until the prothrombin time is within normal limits. After operation prothrombin values should be determined daily for three or four days, then every other day until the ninth or tenth postoperative day. When prothrombin deficiency is found, vitamin K concentrates and bile salts should be given. Where prothrombin deficiency is shown before operation it is wise to give such treatment postoperatively regardless of prothrombin values. When marked hepatitis is found at operation it seems wise to give vitamin K and bile salts postoperatively regardless of prothrombin values. Intravenous injections of glucose and blood transfusions should not be ignored in combating the bleeding tendency.

Indications for Opening Common Duct

When should the common duct be opened? Routine choledochotomy has a few advocates; but such a policy appears to be too radical. Puestow and Morrison⁹ measured the common duct in 527 routine necropsies showing no biliary tract disease and found the average circumference in adults to be 12.1 millimeters. In other words, in a person of average weight, the common duct is

*One-tenth cubic centimeter thromboplastin is placed in a three cubic centimeter tube and freshly drawn blood added up to the one cubic centimeter mark. The tube is inverted once and tilted gently every few seconds and the clotting time observed. This is repeated in a normal individual.

$$\text{Clotting activity (In percentage of normal)} = \frac{\text{Clotting time of normal}}{\text{Clotting time of unknown}} \times 100$$

The above has been found to agree within 15 per cent with quantitative tests. With prothrombin below 30 to 50 per cent, bleeding tendency appears. Above this level blood clots at a normal rate (six to ten minutes).

To prepare thromboplastin, extract 10 grams of ground brain or lung (ox or rabbit) two hours with 10 cubic centimeters saline, strain and preserve in an icebox. If normal exceeds sixty seconds the thromboplastin should be rejected; if less than twenty-five seconds thromboplastin should be diluted with saline.

about the size of a goose quill. Routine exploration would prolong the operation, increase the operative risk and increase the frequency of the second most common cause of secondary biliary operations—stricture of the duct from operative injury. Calculus or other obstruction is followed practically always by dilatation of the duct or thickening or discoloration of its wall.

On the whole, according to present knowledge, it would be wise to open the common duct when:

1. *A calculus is felt or suspected.* Palpation of the common duct should be as much a routine in cholecystectomy as palpation of the gallbladder itself. It is much more difficult to palpate smaller stones which may not be giving symptoms but which may increase in size and cause difficulty later. The common duct is palpated with the index and second fingers of the left hand in the epiploic foramen and the thumb above the hepatico-duodenal ligament. Often it is best to catch the stone between the thumb and fingers and open the duct directly upon it. A floating stone may be milked up from the lower duct and fixed in a favorable position for removal. On occasion, lymph nodes in the gastrohepatic omentum and localized indurated areas in the pancreas cannot be distinguished from calculi by palpation.

2. *When the duct is definitely dilated or thickened.* The enlargement should be beyond the compensatory dilatation accompanying autocholecystectomy.

3. *In the presence of cholangitis or pancreatitis.* Drainage in such instances is indicated in any event. About one in ten common duct stones are in the ampulla. In two out of three patients, the common duct is surrounded completely by pancreatic tissue in the terminal portion.

4. *In the presence of a history of chills, fever, and jaundice.*

5. *In the presence of recurrent or intractable symptoms following biliary operations of any kind.*

Major influencing factors may be: (a) a history of pronounced involuntary vomiting where a stone is not found impacted in the cystic duct; (b) markedly thickened or contracted gallbladder; (c) the presence of small stones in the gallbladder together with a dilated cystic duct; and (d) a history of severe and persistent colic.

Technic of Common Duct Operation

Adequate exposure of the ducts is essential. In the presence of cholelithiasis the gallbladder should not be removed until the ductal system has been examined properly and the organ should not be removed without assurance that the common and hepatic ducts are free of calculi. Exploration through the cystic duct stump is rarely if ever feasible. In the presence of jaundice associated with infection of the biliary tree, it may be wiser in rare instances to drain rather than remove the gallbladder.

A commonly used and practical incision is started high in the angle between the costal cartilage and the xiphoid and extends down not more than 1.5 or 2 cm. from the midline to a point opposite or a little below the umbilicus. The right rectus muscle is split or retracted. The posterior aponeurosis, peritoneum and the nerves in the lower third of the incision are preserved. The incision is from 4 to 5 cm. longer through the fat and subcutaneous tissues than through the fascia. There should be no hesitancy to extend the incision to obtain good exposure.

It is possible to remove calculi in practically all instances by the supraduodenal approach (Kummel's operation, Thornton's operation). The retroduodenal approach (Hassler's operation) is mainly of historical interest now. In very rare instances it may be necessary to open the duodenum at a point 8 cm. distal to the pyloric vein and free the stone either by cutting the sphincter (McBurney's operation) or by transduodenal choledochotomy (Kocher's operation).

By the supraduodenal approach the peritoneum covering the common duct is split parallel to it. The common duct is exposed by blunt dissection. A small artery along the ventral surface of the duct may cause troublesome bleeding. Occasionally the portal vein will lie in the lateral and anterior portion of the hepatico-duodenal ligament usually occupied by the common duct. Because of this it is safe to aspirate with a needle before opening what seems to be the common duct. Unless opened directly upon a stone, the common duct is incised longitudinally about a centimeter below the entrance of the cystic duct. It often is wise to aspirate what appears to be the common duct for bile before incision is made. The duct on either side of the incision may be fixed by two Allis forceps or two fine silk ligatures may be placed.

Insertion of 3 mm. to 8 mm. scoops and a forceps, as well as manual palpation on the inserted scoops may aid in locating a calculus, especially in the ampulla. As many calculi as pos-

Drainage of Common Duct

Operative procedures on the common duct rarely fail to require drainage, with this need continuing up to weeks, months and in some in-

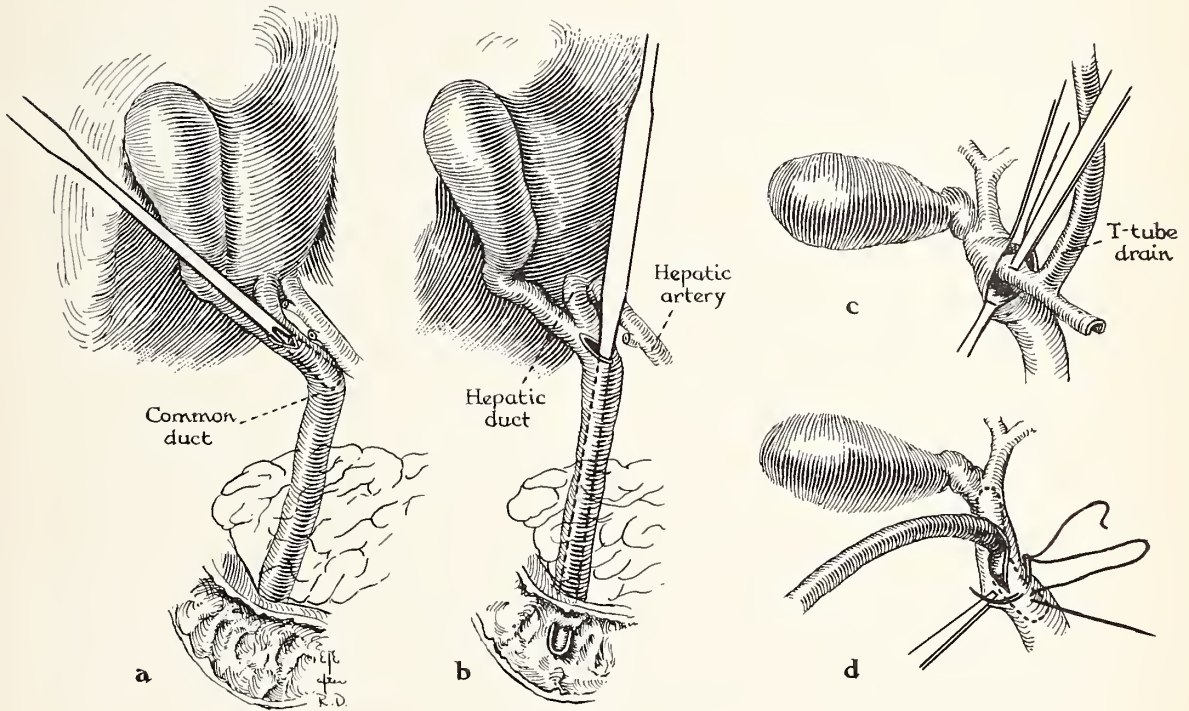


Fig. 1.

sible may be scooped out. Sometimes stones in the hepatic ducts can be flushed down by physiological saline injected into a catheter. Suction may assist delivery of certain stones. Calculi in the substance of the liver are reported rarely, although they must be more frequent than hitherto suspected. Crump¹ studied 1,000 consecutive autopsies in 1931 and found hepatic duct stones in 13 per cent. In a large duct, and when feasible, the finger is the best exploring instrument.

The choledochal sphincter may be dilated gently by graduated rounded scoops or catheters. But caution should be exercised in dilating the sphincter. Recent studies in dogs and man¹⁷ showed traumatic reaction with subsequent spasm and scarring of the sphincter following marked dilatation. Use of catheters insures gentleness in the ampullary and sphincter region. A small catheter (10 F) may be passed through the papilla and saline injected to note filling of the duodenum, indicating the duct is open. Then a larger catheter (16 F) may be passed.

stances years. Three types of drainage tubes may be used: (1) T-tube, (2) L-shaped rubber catheter (Horgan³), or (3) an ordinary urethral catheter. The two limbs of the T-tube crosspiece are cut to about 2.5 centimeters before insertion. It is possible to injure the duct during removal of the T-tube. Cutting a window opposite the vertical limb or removing the bottom half of the crosspiece will reduce such risk. Instances are known of the transverse portion of the tube's having broken off and remained in the common duct. A straight catheter is not adaptable for prolonged periods of drainage. The common duct may be closed with two layers of 00000 chromic catgut on an intestinal needle.

A T-tube can be left in as long as necessary and removed easily, often without anesthesia. Intravenous pentothal or evipal soluble anesthesia may be used if necessary. With a T-tube the flow of bile can be controlled better by clamping, fluids for feeding can be given, the ducts irrigated and roentgenograms made of the biliary

tree. Ten to 20 cubic centimeters hippuran is a good contrast medium for cholelithograms.

Often the drainage tube can be removed during the second or third week following operation. With deep jaundice and marked cholangitis and hepatitis or pancreatitis, prolonged drainage is indicated. The tube should not be removed until the cholangiogram shows the biliary tree has approached normal structure, that no filling defects suggestive of stones are present, and that the opaque medium empties readily into the duodenum (within ten minutes). There should be no discomfort to the patient and no drainage around the tube when it is clamped before removing it. It may be several months before such requirements are met. Tubes have been known to be in place many years without difficulty. Wangenstein¹² has observed a patient carrying common duct catheters for six years.

Summary

A study of surgery of common duct stones encountered in 283 cholecystectomies is presented together with the observations from personal experience and the work of others. Common duct calculi occur in one to two of ten cases of cholecystitis with stones and practically always are best taken care of at the time of the original cholecystectomy. Opening a duct and finding no

calculi should not increase the mortality rate. Indications for opening the common duct are given.

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FULMINATING ULCERATIVE COLITIS

A Critical Analysis of Twenty Cases

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THE course and progress of various forms of ulcerative colitis have been depicted as insidious, severe and fulminating.^{1,2} It has been pointed out that in some cases in which the "fulminating state with progressive severity" exists, death may be the sequel of a most distressing and irresistible illness.

In recent months, many patients with chronic ulcerative colitis have been observed during fulminating exacerbations of their illness. These are patients in whom the disease is definitely not tuberculous or amebic in origin, but in whom

it is of the varieties of types 1, 2, 3, 6 or 7.³ It was felt that a critical study of a number of these cases might be of value.

Approximately 300 cases of chronic ulcerative colitis have been seen at The Mayo Clinic during each of the last three years. In those years between five and seven patients have died from this disease annually. The cases selected for study represent the last ten patients with a fatal outcome of chronic ulcerative colitis prior to August 1, 1939. As a basis for comparison, an analysis was made of ten similar cases of fulminating ulcerative colitis in which the patient recovered. This investigation represents an at-

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tempt to make a critical analysis of the factors contributing toward the mortality in these cases and of the value of our therapeutic efforts, together with an attempt to improve our management of similar cases in the future.

General Data

The ages of the patients in the fatal group ranged between five and seventy-two years, the majority being in the third and fourth decades of life. The ages in the group which recovered ranged between fourteen and forty-two years, the majority being in the third decade. There were four men and six women in the fatal group, while in the group which recovered there were five of each sex. It may be of some interest that nine of the twenty patients were of the Jewish race, five of whom died and four recovered. The patients came from varied walks of life and scattered locations. Most of the patients had enjoyed good general health prior to the onset of the colitis. One of the patients in the fatal group had had attacks of biliary colic, one had had a renal calculus and one had had a duodenal ulcer. In the group which recovered one of the patients had rheumatic endocarditis.

Duration of Illness

There was no correlation between the duration of the illness and the outcome. In the fatal group, the shortest duration of symptoms was seven weeks. Three patients had had their symptoms for less than a year. In the remainder the duration ranged between two and six years. In the group which recovered three of the patients had had their symptoms for less than a year. In the remainder, the duration ranged between one and eight years.

Onset of Illness

The onset of the disease was insidious in five of the fatal cases and in seven of the nonfatal cases. In the remainder of the cases the onset was severe. In all cases in which the symptoms had been present for more than five months before admission, they were intermittent. In the fatal group, in six of the cases the disease became fulminating two to three months before admission to the hospital. In the remaining four, the disease became fulminating while the patient was in the hospital under treatment. In the group which recovered, the disease became

fulminating in eight of the cases during the month preceding admission, while in the remaining two, this change occurred during the patients' stay in the hospital.

Predisposing Factors

In five of the cases in the fatal group, the onset of the attack of colitis from which the patient died was associated with a period of undue nervous stress. In one case an exacerbation followed a dental extraction. In two cases an upper respiratory infection preceded the relapse. In the group which recovered, three of the patients had upper respiratory infections prior to their "flare-ups." Practically all of the patients presented one striking characteristic, regardless of their age or sex, namely, a tense, high-strung, nervous temperament, in most cases associated with a strong tendency toward uncoöperativeness.

Type of Chronic Ulcerative Colitis and Extent of Disease

Only five of the cases of the fatal group were definitely of the streptococcal variety, which we have designated as type 1. The other five were of type 3,³ a nondescript form of ulcerative colitis with irregular proctoscopic, roentgenologic and clinical pictures and one in which the causation is not clear.

At the time of admission, roentgenologic study revealed involvement of the rectum and sigmoid alone in one case in the fatal group. In one case the disease process extended as far as the splenic flexure and in one case as far as the hepatic flexure. The entire colon was involved in two cases. In one case no involvement was demonstrable until the disease had progressed to such a degree that further studies could not be made with safety. Four of the patients were too ill to undergo roentgenologic examination. At necropsy there was involvement of the entire large intestine in all cases.

In the group which recovered, eight cases were of type 1 and two were of type 3. In one case the rectum and sigmoid alone were involved when the patient was first examined. The disease process extended as high as the splenic flexure in one case. In seven cases the entire colon was diseased, while in another case the entire colon and the terminal ileum were also involved.

Proctoscopic examination showed active dis-

ease of the bowel wall in all cases of both groups.

Bacteriologic Studies

In the fatal group, the streptococcus of colitis (Bargen¹) was isolated from the stools in only two cases. Streptococcus faecalis and Streptococcus zymogenes were found in one case. The stools in the remaining cases revealed no unusual bacteria. Blood cultures made in four cases failed to grow bacteria. Serologic agglutinations for typhoid fever, paratyphoid fever and paradysentery were negative in four of the five cases in which these tests were performed. However, in the fifth, a test for Shigella paradysenteriae (Flexner) was reported positive (1-640) but the organisms were absent from the stools in repeated cultures.

In the group which recovered, the streptococcus of colitis (Bargen¹) was isolated from the stools in nine cases. One of these stool specimens also was found to contain Salmonella enteritidis. Blood cultures were made in five cases but no bacteria grew. The results of the serologic agglutination tests for typhoid fever, paratyphoid fever and paradysentery performed in three cases were reported negative.

It is of interest that one of the patients in each group had undergone treatment for amebiasis prior to admission. One patient in the fatal group had been treated for bacillary dysentery and one in the group which recovered had been treated for paratyphoid fever without improvement before admission.

Blood Picture

All patients, except one in the fatal group, showed moderate to severe anemia on admission. Leukocyte counts were for the most part slightly elevated but in only two cases did they exceed 15,000 in each cubic millimeter of blood on admission. No correlation was apparent between the leukocyte count and the severity of the disease. Differential counts showed nothing characteristic but study of the smears revealed a toxic blood picture as indicated by a reversal of the normal filament-nonfilament ratio. The sedimentation rate was elevated in all cases. In three of the cases in which bleeding was a prominent feature, prothrombin deficiency was demonstrated. In each of these cases bleeding ceased

and the prothrombin values approached normal following administration of vitamin K.

Course

The clinical picture and progress of these patients during their stay in the hospital made possible the recognition of two distinct groups. Patients whose symptoms were in the main those produced by a severe thrombo-ulcerative process in the wall of the large bowel composed the first group. These patients had high fever, toxemia, dysentery, hemorrhages, signs of peritoneal irritation and sometimes even actual perforation of the bowel wall. The second group was composed of patients whose predominant symptoms were secondary to the changes in the bowel wall. These were the patients with marked deficiency states, characterized by severe anemia, emaciation, low serum protein, edema and ascites, and in whom fever and toxemia were less prominent features.

Among the patients who died, seven fell into the first group and three into the second. Among the patients who survived, seven fell into the first group and two into the second. One of the survivors began in the first group, but following ileostomy his symptoms became predominantly those of the second group. In general, if the disease process continued at a fulminating level for more than five weeks, signs of deficiency were found to appear.

Complications

These were more common and of a more severe nature in the fatal group than in the non-fatal group. Perforation was the most serious complication and one of the most common in the fatal group. The development of jaundice was an infrequent and inauspicious occurrence. From a prognostic standpoint the development of severe edema seemed to be a discouraging sign. Table 1 indicates the incidence of complications.

Cause of Death

Among the patients who died, peritonitis was the cause of death in five cases. One patient with femoral phlebitis died from pulmonary embolism. Overwhelming toxemia was the cause of death in two cases. The seventy-two-year-old patient died of coronary occlusion. In one case, the cause of death was thought to be acute yellow atrophy of the liver.

TABLE I. INCIDENCE OF COMPLICATIONS IN
FULMINATING THROMBO-ULCERATIVE
COLITIS

Complication	Occurrence among ten patients who died	Occurrence among ten patients who survived
Perforation; peritonitis	6	1
Hemorrhage	2	1
Perianal abscess; fistula	2	6
Polyps	3	2
Contraction; stricture	4	7
Carcinoma	1	0
Jaundice	3	0
Arthritis	0	2
Neuritis	0	1
Otitis media, acute	1	0
Stomatitis; pharyngitis	4	2
Parotitis	1	0
Urinary tract infection	1	0
Cutaneous lesions	0	3
Abscesses (other than perianal)	1	0
Phlebitis	1	1
Edema; ascites	8	3
Total	38	29

Treatment

The treatment of all patients was carried out along the same general lines. When their condition permitted they received a low residue diet, rich in proteins and vitamins. In the presence of peritoneal irritation or impending perforation, feedings were stopped and fluid, nourishment and medications were given parenterally. Vitamin concentrates were supplied liberally.

Antistreptococcic serum (Bargen¹) was administered intramuscularly to eight of the patients who died but only three received what we have considered an amount having therapeutic effect. Two of these patients received only a few isolated injections before death. Small doses of this serum were administered intravenously to three other patients in this group. All of the patients who recovered received an adequate

course of serum therapy. Three of them also were given serum by intravenous injection and one of them received several large doses of antidyenteric serum by this route.

All but one of the patients who survived received colitis streptococcus (Bargen¹) vaccine before discharge. Only two of the patients who died had the benefit of this form of therapy.

Eight of the patients who died received courses of treatment with sulfanilamide or neoprontosil, most of them in amounts which have been of value in the milder cases. Only three of the patients who recovered received these drugs.

Ileostomy was performed on two of the patients in the fatal group and on one of the patients who survived.

Other forms of therapy included blood transfusions, liver extracts, 100 per cent oxygen, courses of emetine, atabrin, various arsenical preparations, histidine hydrochloride and glycine. Sedatives and symptomatic treatment were administered as indicated.

Among the patients who died, four were extremely ill on admission and followed a steady downhill course in spite of everything that was done. One patient seemed to be benefited by therapy but succumbed to a heart attack. The remaining five patients, comparatively speaking, were only moderately ill at the time of admission, yet each of them took an unexpected turn for the worse while under treatment. In one case, an upper respiratory infection seemed to be the precipitating factor. A second was a case of type 3 in which lesions were not noted at the time of the first proctoscopic examination but in which severe ulcerative disease was noted at a second examination two weeks later. In two cases, the cause of the exacerbation was not apparent but the subsequent development of jaundice and coma indicated severe liver damage. In the fifth case, no explanation was at hand.

Among the patients who survived, a single factor to which the credit could be given for the improvement which took place was not apparent. In one, a dramatic response seemed to result from intravenously administered anticolitis serum and in another from the use of 100 per cent oxygen. In another, emetine hydrochloride seemed to alter the course of events. Autogenous vaccine, carbarsone, antidyenteric serum and anticolitis serum, each in its turn, seemed to be the deciding factor. The relief of anasarca by salyr-

gan was followed by prompt general improvement in one case. Surveying the group as a whole, it is apparent that the important feature in the management of these cases was the institution of a well balanced program along the lines outlined at the beginning of this section. Rest, diet, sera and vaccines, neoprontosil and symptomatic measures combined to produce a salutary effect which does not seem to have been achieved by any one measure alone.

Sulfanilamide and neoprontosil represent the latest addition to the therapy of ulcerative colitis. Many patients suffering from chronic ulcerative colitis, especially of the streptococcal and of the "insidious" to "severe" variety, derive unquestionable benefits from the administration of these drugs. However, the institution of this type of treatment often is attended by a transient increase in the number of daily bowel movements, with malaise, nausea and sometimes slight hyperpyrexia. One wonders whether more severe reactions, the "unexplained exacerbations" in the hospital, may not in some cases have been related to the use of sulfamido preparations. In four of the cases herein discussed exacerbations developed following courses of neoprontosil. All of the patients who became jaundiced had received sulfanilamide derivatives. The exact rôle which sulfamido drugs played in the production of these undesirable reactions is difficult to determine, but their occurrence should serve as a warning that the sulfamido group of drugs should be used with caution in the treatment of "chronic ulcerative colitis," particularly of the "fulminating" type.

Summary

A study of ten fatal cases of fulminating thrombo-ulcerative colitis and other severe ulcerative colitis and of ten cases in which the patient recovered has been made. Most of the patients were in the third or fourth decade of life. Nine of the twenty patients were Jews.

The severity of the disease and the outcome bore no relation to the duration of the symptoms,

the mode of onset, the type or extent of involvement of the colon at the time of admission or to the blood picture. The similarity in the course of the two groups of cases is emphasized by the fact that in each group there were seven cases with severe sepsis and two or three with secondary deficiency states.

Streptococci of colitis (Bargen¹) were recovered from the stools in all but one of the cases in which the patient survived but in only two of the cases in which the patient died.

In most cases the clinical picture and course were produced or, at least, influenced by the severity of the infective process but in a certain number a secondary deficiency state was the predominant feature.

Perforation, jaundice and edema were the most serious complications from the standpoint of prognosis. Perforation and peritonitis were the most common causes of death.

No one drug or procedure is curative in "chronic ulcerative colitis" of this fulminating variety. A well planned program, including the use of serums and vaccine and embracing dietary and medicinal aids, seems to be the best form of treatment. It is important to point out that each of the ten patients who survived received what we considered an adequate course of serum. Few of the ten who died received amounts of serum worthy of comment. Nine of the patients who survived received anticolitis vaccine as well. Only two of the patients who died received the vaccine.

The use of sulfanilamide and neoprontosil in the treatment of chronic ulcerative colitis is still in a trial stage. Although of proved value in many cases of this disease, its use is not entirely unattended by danger, especially in cases of the fulminating variety.

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The early symptoms of renal tuberculosis are not appreciated, and genito-urinary tuberculosis is regarded as a disease by itself and not as a manifestation of a generalized tuberculous condition. As a result, adequate convalescence and expert after-care are not insisted upon. Sanatorium treatment and continued supervision after operation or local treatment will favorably influence the general prognosis. J. Carver, M.D., *Tubercle*, April, 1939.

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN WINONA COUNTY

(Continued from April issue)

In July of the year of its incorporation, the Winona County Medical Society adopted a regulative fee table and passed resolutions on such matters as interest on unpaid accounts and reduced fees for the poor. Dr. Sheardown was president during the year 1870 and Dr. Cole in 1871. By that time the organization was strengthened and special semi-monthly meetings were held for the discussion of questions such as "The Use of Sulphuric Ether in Obstetrics," "The Use of Hydrate of Chloral," and other topics of interest to the profession. At another meeting, Dr. McGaughey read a paper on the "Purity and Proper Preparation of Medicine," after which a discussion of the merits of different manufacturers and of the city druggists took place.

Another essay by Dr. McGaughey was read at a meeting in 1874 on "Cholera Infantum" in which, aside from the medical treatment, he dwelt emphatically upon importance of utmost cleanliness in the entire surroundings. At the same meeting, Dr. Staples presented an interesting case of congenital deformity which evoked much discussion.

As early as the year 1872 a preparatory medical school was organized in Winona City. It proposed to give preparation for admission into medical colleges. Students were divided into two classes of which the first included those who had not attended college lectures. These received instruction in the fundamental branches. The second group, comprising those who had attended one course of lectures, received instruction in the advanced branches. The school had recitation and dissection rooms and an anatomical and pathological museum. Drs. Franklin Staples, J. B. McGaughey, James M. Cole, D. A. Stewart, and A. P. Gilmore composed the original board of instructors. During the decade or more of its existence, other doctors served on the faculty. Drs. A. B. Stuart, F. Lessing, S. B. Sheardown, and A. Young taught at different times. The original board of instructors, however, was the backbone of the organization and they continued their services from the beginning until the school was discontinued between 1882 and 1886.

Dr. Darwin A. Stewart, who had much to do with the school, was a typical pioneer physician, who built up a large practice, and endeared himself to a large circle of patients and friends. He settled in Winona in 1870 and remained there until his death in 1914. During this time he held many public offices and positions of honor in the community.

The physicians of Winona County numbered about one hundred in the year 1870. Many of them practiced at Winona, the population of which, estimated at eight thousand, comprised more than a third of the inhabitants of the county. Several small towns had no physician and called upon those of Winona in times of need. Elba, with a population of 700, Minnesota City, Dresbach, and New Hartford had no physicians during the early seventies. Occasionally Winona physicians were called outside the county or across the river.

During the seventies the birth rate, as indicated by figures for the county and

for the city of Winona, greatly exceeded the death rate. For example, the births for the year 1874 in Winona City numbered 226, while only 130 deaths were recorded. For the county, figures of 1872 show 674 births and 322 deaths. These statistics and the number of incoming settlers are evidence of a community still in its period of rapid growth. New physicians came with the settlers, sometimes five or six in a year.

Several slight epidemics occurred at this time. Early in 1872 whooping cough was prevalent among the children of Winona and vaccination was highly recommended for its prevention. At the same time news came of a smallpox epidemic in the East and of its spreading westward. One physician in Winona City vaccinated 150 persons in a day. This and many other precautions were advised. At the end of the year, only seven deaths from smallpox were reported in Winona, a few at Minnesota City, and none throughout the rest of the county.

Scarlet fever came occasionally in the early seventies, but become more serious in 1876, when twenty-three deaths occurred within a short time in Winona. The disease raged throughout the state during the following year.

Isolated cases of diphtheria were treated from time to time and the disease was reported to be alarming at Saint Charles in November, 1877. There were fourteen fatal cases in Winona the next year, concerning which Dr. Staples wrote in his report to the State Board of Health, "The City of Winona has a population of a little over 12,000 . . . the City has never known an epidemic of diphtheria." Although he mentioned the number of deaths occurring from the disease, such a small percentage was not to be reckoned an epidemic. However, it was considered epidemic elsewhere near Winona. Minneiska and Trempealeau were badly stricken in 1877. In the winter and spring of 1878, thirty cases occurred at Lewiston, a village of three hundred persons. Eleven of these cases proved fatal. In this instance sanitary conditions were known to be poor. Dr. Franklin Staples made a thorough investigation of conditions, continuing it for several years when the epidemic persisted during the eighties. His reports may be found in the records of the State Board of Health, of which he was then a member.

He stated that diphtheria was alarmingly on the increase and that in 1879 more than 13 per cent of deaths in Minnesota occurred from this single cause. Secondly, he emphasized the point that the disease to a great extent was preventable by sanitary means. In November, 1879, a circular inquiry concerning the prevalence of diphtheria in the state from November 1, 1878, to November 1, 1879, was issued to correspondents. One hundred and twenty-nine replies were received. Winona County numbered two deaths from diphtheria among a total of 295 (about $\frac{3}{4}$ per cent as compared to the 13 per cent stated above). Obviously the epidemic did not make much headway at Winona.

The *Scientific American* and other prominent journals quoted liberally from this treatise by Dr. Staples. Staples deserves far more mention than has been accorded him here. He was appointed by the State Board of Health to investigate the effect of the climate of Minnesota on catarrh, pneumonia, and phthisis pulmonalis. He had made studies along this line for some time and the report was published in 1875. During the same year, Dr. Staples made a report before the American Medical Association on "The Influence of Minnesota Climate on Pulmonary Diseases." He was president of the Minnesota State Medical Society in 1871 and always took a very active part in the organization. He was also Vice President of the American Medical Association and without doubt one of the most able physicians of his time in Minnesota.

No record can be found of an adequately equipped hospital in Winona during

the seventies or before. It was not until 1894 that the Winona General Hospital was organized under the guidance of Dr. Donald B. Pritchard. A city hospital and pest-house existed at the city of Winona in 1884. It was in charge of Mr. F. Deertz and under the direction of the local board of health. Mr. Deertz' residence, for such was the hospital, was kept up by himself and his family, and it is recorded that only one patient was treated there in 1884. In October, 1885, the city council of Winona received a report by the city attorney relative to the title of lots proposed to be purchased for the city hospital, but no immediate action took place. Curtiss Wedge recounts in his *History of Winona County* that Saint John Hospital conducted by the Sisters of Saint Joseph was the first adequately equipped hospital in Winona. This was discontinued in 1904 but no date can be found of its foundation.

The Homeopathic Medical Society of Southern Minnesota became an active organization during the seventies. Several of the physicians practicing in Winona at this time belonged to the homeopathic school, among them Dr. T. A. Pierce. The fact that there was good natured contention between the two schools is shown in an incident which took place at the 1882 meeting of the Winona Board of Education. There were eight members of the board, and they stood evenly divided. With Drs. J. B. McGaughey and T. A. Pierce as candidates for president, one hundred and thirty-eight ballots were cast, mostly four for one doctor and four for the other doctor, with an occasional varying vote for some other member of the board. It is recorded that after a monotonous session of seven hours, the board adjourned until April 26, when the dogged determination of the friends of their respective candidates continued unabated until 2 o'clock on the following morning. On the 187th ballot, Dr. J. B. McGaughey, the "old school" physician, was elected, his victory finally being recorded as by a unanimous vote. An explanation given by one of the members was that a traitor fled to the enemy. This determined and protracted struggle was not actuated by personal or political feeling, but by the professional pride of adherents of the two candidates who belonged to different schools of medicine. During both sessions of the board when the balloting was in progress, good humor prevailed, and no bitterness of feeling was engendered thereafter.*

During this decade, several new members were taken in to the Winona County Medical Society. Dr. Darwin A. Stewart, who graduated from the College of Physicians and Surgeons of New York City in 1869, was made a member in 1871. Dr. Ferdinand Lessing came in 1875 from Wabasha, and the same year became a member of the society. For several years he held the office of county coroner. In 1876 Dr. Arnold P. Gilmore and Dr. Arthur B. Young, both new arrivals, joined the society. Gilmore was an eye, ear, and throat specialist of high reputation, who had received his training at the Jefferson Medical College. His stay in Winona was brief for he moved to Chicago in 1879. Dr. Young came from Minneapolis in July, 1875, and immediately became a partner of Dr. J. B. McGaughey. Nine years later, Dr. Young left Winona City and took up his abode in Prescott, Wisconsin.

Dr. Henry B. Wedel, who was an organizer of the medical society in 1866, became a member of the Winona County Medical Society in 1879 and was elected president for that year. He arrived in 1862, having recently graduated with distinction from the medical department of the University of Pennsylvania. His career is marked by three years of active surgical work during the war. Not long after his return, he relinquished his practice and became associated with William Netter in the drug business. Twelve years later, he

*This incident is quoted from the "History of Winona County Minnesota" by Curtiss Wedge.

again began to practice and it was about that time that he was elected to membership in the Winona County Medical Society.

Dr. Thomas McDavitt, who graduated from the Chicago Medical College in 1879, was admitted to the society in 1882, and became president the following year. Dr. J. W. Scott, who located at Saint Charles in November, 1882, was almost immediately proposed for membership in the county medical society and was admitted a short time later. He had graduated two years before from the medical department of the University of Wooster. In 1883 Dr. James B. Cole of Minneiska, son of Dr. James M. Cole, and Dr. Thomas W. Sheardown of Stockton, son of Dr. S. B. Sheardown, became members of the medical society. Neither of these young doctors was a permanent resident of Winona County. At the same time, Dr. Wm. A. Chamberlain of Saint Charles became a member. Chamberlain moved to Winona the same year with his wife and infant son.

Drs. C. A. Boyd of Lewiston, Edward D. Keyes, Edson Rhodes, Rudolph C. Teschan of Winona, and Wm. J. Newberry of Minnesota City were made members in 1885.

The obvious limitation of membership and the reputations of the older members speak well for the quality of the society. It was, therefore, a recommendation for the young men to be admitted to membership during those pioneering years.

About 1885 a local medical organization grew up at Winona. It held monthly meetings at the offices of different members, one doctor being appointed essayist for each evening. The presence of Drs. Teschan, Cole, Keyes, Staples, S. B. Sheardown, T. B. Sheardown, McDavitt, McGaughey, Rhodes, and Seilers of Alma is recorded. Judging from the available material, it was a loosely organized, conversational type of society. Several reports, essays, or case histories were read at each meeting and discussion followed. The health of the community was a matter of principal concern among them.

During the last few years with which this essay is concerned, two severe epidemics occurred in the state and surrounding territory, both of which were continuations of those of the preceding decade. The diphtheria epidemic which prevailed in the state during the 1870's continued to take a large toll. Deaths in the state resulting from this disease during the year 1881 numbered 1,397 or 12.12 per cent of the total mortality. It seems scarcely to have touched Winona County until 1885 when an outbreak occurred at Saint Charles. The Saint Charles newspaper correspondent wrote:

"For a long time nothing has created such an excitement in Saint Charles as the diphtheria controversy between the Board of Health and Dr. Burt."

The exact nature of the controversy was not recorded, but it does suggest active concern for the health of the village.

Public schools of Saint Charles were closed in October, and though they opened in November, attendance was greatly reduced. A specimen of water from the well in the school yard was sent to Saint Paul for analysis, and proved to be unusually pure and free from organic matter. However, the sanitary conditions were known to be in need of improvement. During the winter and spring of this year, seven deaths from diphtheria were reported at Winona. No comment from the local health officer has been found.

Statistics show an extremely serious series of smallpox outbreaks throughout the state in the years 1880 to 1885. In 1881 the local board of health at Winona required every person over three months old to be vaccinated, and

most of the citizens complied with the requirement. The city remained free from the disease during these years. Again in 1885 pressure was brought to bear by the health board, which recommended to the Board of Education that all children attending public schools should furnish evidence of having been successfully vaccinated. The report was tabled, however.

Two or three deaths were reported in the county each year as a result of diphtheria but the disease did not become epidemic. Scarlet fever proved to be a menace during this period, especially to children. Several severe cases were reported at Winona and at Utica in the summer of 1882. Two years later, four deaths were reported among children at Winona. In January, 1885, the disease prevailed at Saint Paul but "not to an alarming degree at Winona." In March, it was recorded that "scarlet fever prevailed in a mild form to a considerable extent at Winona."

Although measles was not reported elsewhere during this period, a severe outbreak appears to have occurred at Dakota village. The following quotation is from "The History of Winona County, Minnesota" published in 1883:

"In May and June, 1882, the village of Dakota was visited by the most severe and alarming sickness that ever struck this healthy little town. Charley Dalton, while on a trip west of St. Paul, caught what was supposed to be the measles. After returning home, he came down very sick. In a few days the whole town became helplessly prostrated. Physicians were called and pronounced it the measles and a slight form of scarlatina. For four weeks every family in town was so stricken that there were not enough well to wait on the sick. . . . The sickness spread to surrounding vicinities, and was very severe in some families. . . ."

Other ills which touched the county at this time included malarial fevers which prevailed around Minnesota City quite extensively in October, 1881, and were thought to be caused by the extreme wet and heat of the summer.

In January, 1883, a neuralgic epidemic, called epizootic, prevailed in Winona and in adjacent Wisconsin towns. The disorder was characterized by severe earache, acute pains in the head, teeth, and face, discharges from the ears and nose, and more or less fever.

Much sickness was reported at Dresbach in the fall of 1883, the details of which remain unrecorded. In the winter of 1884 and 1885, whooping cough was common at Minnesota City. The following August, Saint Charles reported the prevalence of influenza.

The deaths of the county in these five years resulted mainly from non-infectious or non-contagious diseases. Most of the deaths of 1881 resulted from heart disease. A typical report by the Winona City health officer in August, 1883, recorded twenty-two deaths. Six were caused by dysentery, five by diarrhea, one by cholera infantum, two by meningitis; none resulted from contagious diseases. In 1884, also, no epidemic touched the city; the mortality rate was .015 per cent; the population being 16,000 and the number of deaths 237 for the year. It was noted that "a large number of the deaths of young children and most cases of puerperal fever would not have occurred under proper hygienic management."

Local boards of health increased in number in the state about 1885 and became better organized. A conference of state and local boards of health and popular sanitary councils for southeastern Minnesota met in October, 1885. Among those present were Dr. J. W. Scott of Saint Charles, and J. P. Mumford, who was sanitary inspector of Winona though he did not hold a medical degree. Dr. Franklin Staples continued to hold office as health officer of Winona.

These local boards of health were not always composed of physicians, but usually included some outstanding members of the community who would have an interest in the sanitation and well-being of the village.

It is interesting to note that in the year 1885 Winona and other river towns presented a protest through the State Board of Health to the governor to the effect that the time had come for putting an end to defiling the Mississippi River by making it the cesspool of the state. This, however, was ineffective. From that time until now, the State Board of Health has continued its efforts in that direction, and only recently has its protest received proper consideration.

Physicians who came to Winona County in 1886 were Thomas A. Pierce and C. N. Clark. In 1887 F. O. Drake came to Winona from Red Wing and D. C. Lewis from Brooklyn, N. Y., to Saint Charles. H. S. Wahl moved from Minnesota City to Winona; A. H. Trow came from Chatfield to Dakota; and J. Martin left Saint Charles to locate in Little Falls. In July, 1887, there were twenty-two physicians in Winona County.

In November, 1888, a bazaar held for the benefit of Saint Johns Hospital netted almost three thousand dollars, and helped greatly to maintain that institution. In 1890 a considerable sum was raised for the same purpose by a series of ball games among the physicians, dentists, and pharmacists of Winona. The doctors lost all their games. Dr. Sheardown died in 1888. Dr. Donald R. Prichard came to Winona in the same year. During the year 1891 J. W. Timmons came to Winona from Homer, and Royes and J. Wilson to Pickwick. E. D. Stoddard moved to Stewartville, Clark Christian to Witoka, T. R. Wilson to Pickwick, and John Morrison to Winona, from New York, and Dr. English arrived. In 1893 S. C. Vandergee came to Wyattville. Francis F. James to Winona from Tracy in 1894; in the following year W. E. and Louise Aubin became residents of the town. In 1896 Dr. Slocumb and Dr. Steinbach located there. Other physicians who selected Winona as their home were E. S. Muir, N. S. Lane, Oswald Leicht, Francis Roberge, and Engleken, who came in 1898; and J. F. Millspaugh and O. F. Gile in 1899. Dr. Gile later moved to Dakota. Dr. P. B. Blair arrived in 1900. In the same year Dr. Forger was located at Elba, Dr. Wilmot at Clyde, Dr. Hutchins at Whitehall, and Harvey Brown at Rollingstone.

We have been unable to trace the further history of many of these men. Dr. Louise Aubin, however, moved to Stillwater, while Drs. E. D. Keyes, John Dwight Keyes, H. M. Lichtenstein, Donald B. Prichard, and Charles P. Robbins remained in Winona, Dr. Hiram C. Baer at Saint Charles, and Dr. O. F. Gile at Dakota.

The presidents of the Winona County Medical Society from 1885 to 1900 were as follows:

1885 —Franklin Staples	1891-3—Franklin Staples	1897 —D. B. Prichard
1886 —J. M. Cole	1894 —J. W. Scott	1898 —H. M. Lichtenstein
1887-8—R. C. Teschan	1895 —J. M. Cole	1899 —E. D. Keyes
1889 —S. B. Sheardown	1896 —W. A. Chamberlain	1900 —J. W. Scott
1890 —E. D. Keyes		

J. B. McGaughey was secretary of the society from 1873 to 1908.

A medical organization known as the Winona Medical and Surgical Society met for a time in the early part of 1890. It is stated that the society had existed in name only for a period of two years, and that it was reorganized at this time. Meetings were to be held fortnightly. At the meeting held on February 7, 1890, Dr. McGaughey was elected president, and Dr. McDavitt was chosen secretary. The last meeting of which record has been found was held on February 20, 1890.

(To be continued in the June issue)

President's Letter

THE Committee on Tuberculosis has an ambitious program. It hopes to eradicate tuberculosis from our state—not in general, but completely. The members of the committee believe this can be done.

Three decades ago tuberculosis occupied first place as the cause of death in the United States; today it is seventh. In 1918 there were 2,543 deaths from tuberculosis in our state; in 1938, there were 816, and last year 804, a rate of thirty per hundred thousand.

The factor which encourages the committee to this bold hope is the specificity of the tuberculin test. Bovine tuberculosis was very prevalent up to 1917. In that year testing of cattle by the tuberculin test and the removal of all positive reactors was started. This resulted in a prompt lessening of the incidence of the disease. Post mortems of positive reactors showed tuberculosis in 97 per cent. Today all but six counties in the nation have been accredited. These six counties are in California, which state has been slow to use the test. In England, where the test is not used, bovine tuberculosis is just as prevalent as it was in 1915; and among human beings, 25 per cent of the cases of tuberculous meningitis, 50 per cent of the cases of lupus, 20 per cent of the cases of tuberculosis of the bones and joints, and even 3 per cent of the cases of pulmonary tuberculosis are of the bovine type.

The plans of the Committee are not fully formulated but in general will consist of the following:

1. Apply the tuberculin test to the entire personnel of each household in every county.
2. Make a radiographic study of every positive reactor.
3. Make additional laboratory and medical examination to complete the diagnosis.
4. Provide adequate segregation and treatment for each patient as long as he is infectious.

A more economical plan would be as follows:

1. Concentrate x-ray studies particularly on the tuberculin sensitive adults present in each home in which tuberculin sensitive children are found.
2. Radiograph adults who are positive reactors and whose children have negative reactions to tuberculosis.
3. Reapply a tuberculin test to all future members of population and all who were negative on previous survey at least annually.
4. Concentrate x-ray studies particularly on tuberculin sensitive adults in each home in which tuberculin sensitive children are found, and repeat them at least annually.

To be effective, it will require the coöperation of every physician in the state. A state-wide program of education must be carried out efficiently. It will be necessary to raise funds for filming, hospitalization of active cases, and for follow-up work.

This is a large program which must be continued for many years. Such diseases as diphtheria, smallpox, typhoid, yellow fever have been brought under control by medical science. Considering the long course of the disease, its universal and continuous incidence, and the economic and social loss caused, tuberculosis has been a far more serious disease. If the White Plague can be eradicated, it will be the greatest feat ever accomplished by medical science.

BERTRAM S. ADAMS, President

Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

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STATE MEETING—1940

THE annual State Medical Association meet-
ing at Rochester last month fully satisfied
expectations, both as to attendance and scientific
program. This meeting has come to be one of
the largest annual meetings in this part of the
country. Some 3,400 registrations included
about 2,000 physicians from Minnesota and sur-
rounding states.

The new Rochester auditorium, which was
used for the first time for a medical meeting,
proved ideal, for the acoustics of the amphi-
theater obviated any need for a loud speaker and
the adjoining rooms well accommodated the
scientific and commercial exhibits.

Officers chosen by the House of Delegates
included Dr. B. J. Branton, Willmar, president;

Dr. Albert Fritsche, New Ulm, vice president;
Dr. Frank J. Heck, Rochester, second vice presi-
dent; Dr. Benjamin B. Souster, Saint Paul, Sec-
retary (re-elected); Dr. W. H. Condit, Minne-
apolis, treasurer (re-elected). Dr. W. W. Will,
Bertha, and Dr. E. A. Meyerding, Saint Paul,
were re-elected speaker and vice speaker, respec-
tively, of the House of Delegates. Dr. W. A.
Coventry, Duluth, and Dr. W. F. Braasch,
Rochester, were re-elected A.M.A. delegates,
with Dr. J. C. Hultkrans, Minneapolis, and Dr.
W. L. Burnap, Fergus Falls, re-elected alter-
nates. Dr. Carl M. Johnson, Dawson, was elected
councilor of the Third District to replace Dr.
B. J. Branton.

Dr. Henry Ulrich, Minneapolis, was elected
by the Editing and Publishing Committee of
MINNESOTA MEDICINE as Associate Editor of
the journal to take the place left vacant by Dr.
Gilbert Cottam.

The full capacity of the dining room at the
Rochester State Hospital was taxed by some 465
members, wives and guests at the banquet Tues-
day evening. Unfortunately many were unable
to obtain tickets. Following the banquet the
diners were addressed by Governor Stassen who
spoke in his characteristically forceful manner
on fundamentals and trends in government and
announced his intention of appointing in the near
future a commission to draw up a suitable
memorial to those two outstanding Minnesota
surgeons, Drs. William J. and Charles H. Mayo.
The address of Mr. Bernard H. Ridder, pub-
lisher of the *Saint Paul Pioneer Press and Dis-
patch*, on Hitler proved particularly interesting
because of his personal acquaintances with the
Führer.

The prize presented each year by the Southern
Minnesota Medical Association for the best
scientific exhibit at the State meeting was this
year awarded to Dr. Carl W. Waldron, Minne-
apolis, for his exhibit of Fractures of the Facial
Bones. Honorable mention was given Harry
Wilmer of the Department of Pathology at the
University of Minnesota Medical School for his
exhibit of Injected Kidneys.

Saint Paul was chosen as the place of meeting
for 1941.

SCUTTling THE EPONYMS

EVER since medicine in all its branches really began to advance it has become increasingly evident that something would have to be done about the various nomenclatures. These had simply accumulated, from the earliest times, without any semblance of order or system. Anatomic structures, pathologic conditions, clinical symptoms, methods of diagnosis, diseases, surgical instruments, surgical operation, et cetera, were often given the names of those who had discovered or first described them, without any other indication of their nature or function. It was a pretty custom and wholly unobjectionable in the days of vague medical knowledge, when sentiment and a desire to pay tribute to great names had been in the ascendent over a long period of time, but it was totally out of step with the trends of modern times, in which not only are precise facts the basis of all scientific progress but accurate terminology predicated on orderly planning are equally essential.

Strangely enough the first serious effort to correct this situation came in the field of anatomy. The Anatomische Gesellschaft, the leading society of anatomists in Germany, held numerous conferences about fifty years ago and at its ninth formal meeting in Basel, Switzerland, on April 19, 1895, adopted what is known as the BNA (Basel Nomina Anatomica) in which all eponyms had been dropped and all structures given Latin names which either described their appearance or connote their functions. It is, today, the foundation of all modern works on anatomy, although modifications, without disturbance of the basic principles, are still in course of discussion. Thus there is the NK (Nomenklatur Kommission), the British Nomenclature, in Latin and English and, finally, the International Commission to assemble and correlate all available data, the latter still in existence.

In bacteriology many difficulties arose. Some years ago a committee of the Society of American Bacteriologists spent several years in formulating a scheme of classification and nomenclature of bacterial types, which has been fairly generally accepted, in this country at least, as best meeting the varied and difficult requirements of the situation. The classification extends from

order to family and subfamily, tribe and genus, before the individual microorganism is reached. The eponymic motif has been preserved in part and turns up now and again even as high up in the family tree as in the tribe (e.g. Neisserieæ) and quite often in the genera (Gaffkye, Salmonella, Pfeifferella, Pasteurella, et cetera) and finally in the individual, as in *Clostridium welchii*, although in this instance the more familiar *B. welchii* is still in common use.

The designation of surgical operations by the names of their originators, or modifiers, has long been a source of confusion and error. To obviate this and many other weaknesses the Western Surgical Association appointed a Committee on Names of Surgical Operations more than ten years ago, composed of E. Starr Judd, Kellogg Speed, Harry P. Ritchie and Carl E. Black. Like similar efforts in other fields it proved to be an enormous task, lightened only in some degree by material help from the American Medical Association and by the tireless coöperation of several national surgical organizations and many individuals in this country and abroad. The final result was published in 1935 in a book of 100 pages entitled Names of Surgical Operations, a model of simplicity and clarity and without the use of a single eponym.

Lastly, but by no means the least, come two monumental works which are the products of enormous and effective labor and scientific judgment. These are the Standard Classified Nomenclature of Disease, published in 1935 and subject to revision every five years and the Manual of the International List of Causes of Death, revised every ten years, now in its fifth revision. It is sincerely to be hoped that these two nomenclatures will ultimately come into universal use wherever scientific medicine is practiced.

The eponyms have gone for good. No longer may we speak of Bright's disease, Scarpa's triangle or the Billroth I and II. Sentimentally we are poorer but scientifically far richer by the change, for now we have accuracy and uniformity at our behest and no one who is imbued with the real spirit of progress will have any regrets. A tremendous advance has taken place.

GILBERT COTTAM.

DR. GILBERT COTTAM

IT IS with regret that we announce the loss of the services of Dr. Gilbert Cottam as associate editor of the journal, because of his return to Sioux Falls. His numerous efforts in behalf of the journal and his contribution of numerous editorials since November, 1937, when he became an associate editor, have been greatly appreciated.

Dr. Cottam left Sioux Falls, South Dakota, some twelve years ago. After a brief sojourn in Saint Paul where he was a member of the Ramsey County Medical Society in 1931, he moved to Minneapolis where he took an active interest in the affairs of the Hennepin County Medical Society. He was editor of the Hennepin County *Bulletin* from 1935 until January of this year and gave generously of his time and literary talent to this publication.

A complimentary farewell dinner was given Dr. Cottam at the Minneapolis Club, April 16, by some sixty professional friends. Dr. George Dunn presided and brief speeches were made by two teams of guests headed by Dr. A. E. Benjamin and Dr. W. A. Hanson, the team headed by Dr. Benjamin being instructed to make only complimentary remarks about the guest of honor and the second team just the opposite. Needless to say the first team was awarded the victory by the committee headed by Dr. Olga Hanson.

During Dr. Cottam's comparatively brief residence in Minneapolis he was very active professionally and made a great many friends, whose best wishes he carries with him to Sioux Falls.

HEALTH FOR LABOR

The American Labor Party is trying to win workers over to its health program by means of a bulletin issued periodically under the auspices of its Committee of Medical and Allied Professions. The Party appears determined to present the medical issues of the day fairly and to demand a square deal for the healing professions under whatever program is ultimately adopted. Unfortunately, its medical policies, as set forth in "Health Security Bulletin," appear to have been shaped by the more radical elements of which it is seeking to purge itself. Insistence on compulsory health insurance at this time, when medical and lay opinion are united on the merits of voluntary non-profit medical expense indemnity insurance, is likely to sabotage the development of a harmonious progressive health program. Needless to say, this would cause satisfaction among Communists in and out of the A.L.P.

Except for the issue of compulsory insurance, there is no vital disagreement between the health programs of organized medicine and of the American Labor Party. Both favor state medical aid for the indigent and medically indigent. Both want the maintenance of the traditional doctor-patient relationship and professional participation in the administration of health plans.

The advocates of compulsory sickness insurance, in the American Labor Party as elsewhere, try to confuse the issue by arguing that voluntary insurance would not provide for all who need medical aid. This is true—but neither would compulsory insurance. The insurance principle—whether on a voluntary or compulsory basis—is applicable only to those employed at salaries large enough to permit the payment of premiums without serious deprivation. The unemployed and workers earning mere subsistence wages must receive state help. It is folly, in the name of health, to deprive small wage-earners of health essentials by levying a weekly tax on their already inadequate earnings. The unemployed do not come within the purview of compulsory insurance any more than voluntary.

The "Health Security Bulletin" of the American Labor Party argues that since voluntary insurance almost always leads to compulsory, we might just as well start with the latter. On the contrary, this seems to us another reason for not insisting on compulsory insurance until voluntary schemes have had their chance. If voluntary insurance works out, without the creation of a vast parasitical political bureaucracy, it will be to the advantage of the working class which, in the long run, pays the costs of government. If it fails, the profession will have less reason to oppose compulsory schemes and many valuable administrative lessons will have been learned.

The American Labor Party must realize that the welfare of the working classes is indispensable to the medical profession; the vast majority of physicians have their practice among the poor and middle class. Since medicine and the American Labor Party are united on many of their health aims, would it not be a constructive step for the A.L.P. to postpone its campaign for compulsory insurance, pending the results of voluntary medical expense indemnity, and coöperate with the profession for the enactment of measures on which they are agreed? —Editorial, *New York State Journal of Medicine*, Feb. 1, 1940.

DIAGNOSIS OF TUBERCULOSIS

The modern concept of diagnosis of pulmonary tuberculosis implies a decision as to whether or not the patient has a pulmonary tuberculous lesion; whether the lesion is healed, inactive, or active and an attempt to determine to what phase the lesion belongs, whether primary or in the stage of dissemination. Even the total absence of physical signs does not exclude the presence of a tuberculous lesion, healed or active. Advanced disease may be diagnosed by physical examinations but they cannot be relied upon for the diagnosis of progressive early disease.—P. O. KAYNE, M.D., *Pulmonary Tuberculosis*, Oxford Med. Publication, 1939.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

IS GROUP PRACTICE THE SOLUTION?

Critics of the present methods of medical practice confine most of their efforts to publicizing and magnifying its deficiencies. It is being done by a continuous barrage from social reformers, medical radicals, sensational journalists and New Dealers. As a result, a section of the public is being led to discredit the medical profession and its methods of practice and to believe that there is urgent need of reform. No one is more aware of the deficiencies in the present methods of distributing medical care than the doctor himself. The trouble has been to discover the best means of overcoming the faults without serious injury to the best system of medical care that has as yet been devised. The physician, through organized medicine, has hesitated to make any radical changes for fear of unbalancing the whole structure of medical practice. He has preferred to carefully try out various plans for improvement based on practical experience. Not so the social reformer and uplifter. He does not hesitate to advocate any of a score of plans which are either based on little or no experience or which have governmental support.

"The Mountain Labored"

The main objection to the present methods of medical practice, from the public viewpoint, is, of course, its cost. Medicine cannot be made cheap without having cheap medicine. In case of a medical catastrophe the cost to a family which cannot take care of it becomes a calamity. It is for the solution of such problems that organized medicine is trying out a system of voluntary insurance at a rate which can be met by any non-indigent individual. This plan retains the advantage of a choice of physicians and personal relationship, as well as the stimulus for individual initiative.

Regrettable to say, some of the magazine ar-

ticles antagonistic to organized medicine are written by physicians themselves. In one such article not alone are the conscientious efforts on the part of organized medicine to solve their problems belittled, but, after smearing the medical profession in general, the author questions the ability of his colleagues to care for the sick as individuals. After all this, what was the solution that he offered? The mountain labored and produced a mouse-like solution: namely, Group Medicine.

Group Medicine Advocated

Group Medicine as a solution of the problems affecting medical practice was first recommended by the Majority Report of the Committee on the Cost of Medical Care, and since then has been advocated by many others. It is asserted in the recent article referred to that it would overcome many of the present difficulties involving medical practice, including the evils resulting from professional competition and such problems as the predicament of the recent graduate without sufficient practice to keep him busy. The formation of group clinics to take care of all medical practice is suggested. Even if it were possible, what a wierd form of medical practice we should have if such clinical groups thickly dotted the land. It is certainly open to question whether group practice can be adapted to meet many of the situations met with in the actual practice of medicine. While it may offer certain advantages in urban centers, it would not function so well in rural districts.

No statement is made as to how these groups are to be formed, financed, and given the various facilities which are necessary to success. It is not stated whether they are to be aided by or under government control. The impression is given that successful clinical groups can be formed out of thin air. It is apparently forgotten that

numerous attempts have been made to form clinical groups in the past and that only a very few have survived. It is generally admitted that the successful formation of a group depends upon several factors, including a strong executive at the head, a nucleus of wide clinical opportunities, and exceptional professional ability on the part of the promoters. Many a group has been formed with adequate possibilities, only to be wrecked by professional jealousy, the very objective which group practice is supposed to overcome. It could readily be imagined what would happen to any group which would be formed under durance of governmental control.

Professional Coöperation Valuable

The value of professional coöperation is fully realized by groups of independent physicians situated in urban centers, where many loose associations of this type have been formed. A working arrangement is effected whereby the patient can be examined as indicated by various specialists situated in the same office building. Financial arrangements are made so that the cost can be met according to the income of the patient. This system has had widespread adoption and has worked out very well, in a measure taking the place of a clinic. Clinical groups, however, are in existence which do not function as ideally as pictured and which have no other purpose than commercial gain. It is true that the monthly charge of some of these clinics is comparatively low and on the surface it seems surprising how much can be offered for the money spent. Closer inspection, however, will show that the standards of diagnosis and treatment offered cannot be regarded as "good" medicine. The profits in clinics of this type are often made by extra charges and by the commercial adjuncts of the clinic.

No clinical group can practice good scientific medicine by materially lowering the cost to the patient. It has been asserted that the American Medical Association is opposed to group medicine. This is quite contrary to the truth. The American Medical Association is opposed only to that type of clinical group that does not practice good ethical medicine.

Other Methods Available

It is true that the ability of the men involved is increased by closer association and by in-

creased clinical opportunities. Nevertheless, there are other methods than group medicine to accomplish this purpose among the rank and file of medical men. It is remarkable that after years of thought and investigation by social reformers and the expenditure of a large amount of money by Foundations and even by federal sources for the purpose of reform, no better solution can be advocated to solve the problems of medical practice than Group Medicine.—W.F.B.

PHYSICIANS TAKE THE PLATFORM

It is clear from the multitude of requests for speaking material that doctors are at last alive to the necessity for telling the people how the profession of medicine feels about encroachment of government into the American system of care for the sick.

Response to a recent country-wide questionnaire showed that 98 per cent of the medical men of the country were opposed to socialized medicine. The results received widespread publicity and the people who read about it are certainly justified in wanting to know why.

They have been told repeatedly that the physicians of the country back the American Medical Association in its opposition to the Wagner Health bill and compulsory sickness insurance. Many earnest men and women honestly see in these measures a welcome method for preventing sickness and saving lives. If the doctors see something else besides in such measures, just what is it the doctors see?

It is too much to expect that the general public will accept the unsupported word of the doctor in matters like these. Outside the consulting room the physician must be as explicit in defense of his opinions on public matters as the politician—and far more persuasive.

An Excellent Sign

It is, therefore, an excellent sign that doctors are accepting so many invitations to talk about the national health program and its corrolaries.

Quoted below for their assistance are excerpts from recent talks by Dr. W. A. O'Brien, Minnesota State Medical Association radio speaker and director of post-graduate medical education at the University of Minnesota, who is one of the most skillful and effective speakers in the entire country.

No Depression in Medicine

Said Dr. O'Brien:

"There has been no depression in medical progress since 1920. No period in history has seen so much progress in the prevention and cure of illness.

"Just think, for a minute, of what this phenomenal progress has meant. Before 1920, we had no insulin and diabetics—even diabetic children, were doomed to slow starvation or death in coma.

"We had no liver extract for pernicious anemia. We didn't know how to use iron for the anemia that used to be so common among young girls.

"We had no idea how to control hook worm disease.

"We knew nothing about the vitamins that have so changed our concepts of diet, nothing about nicotinic acid which performs miracles for victims of pellagra nor for the other synthesized fractions of Vitamin B which are offering new hope for so many otherwise hopeless ailments.

"We knew nothing about sulfanilamide or sulfapyridine or any of the related chemical compounds that have revolutionized our treatment of streptococcal infections, of gonorrhea, of pneumonia. Before we had sulfanilamide, for instance, we never had one single treatment that was of any real value for the blood poisoning of women following childbirth.

"Before 1920—"

"Before 1920, we had none of the new anesthetics that have made surgery safe for so many people who were deprived of it in the old days. We knew nothing about modern preparations for operation and nothing about the use of blood transfusions to combat the hazards of surgical treatment. Nothing about the measures that now make it possible, if necessary, to prolong delicate life-saving operations to nine and ten hours without harm to the general condition of the patient.

"We knew nothing about modern care for premature babies by which death rates for babies born too soon was cut in one of our Minnesota hospitals from 65 to 10 per cent in the last four years.

"What does all this mean to us?

Longer Life for All of Us

"It means longer and better life for everybody, of course. But it also means that there are more old people in the population in comparison to the young. It means, among other things, that arthritis is the most common of all diseases today, that allergies are increasing rapidly, that circulatory diseases and heart disease and cancer are taking the place in numerical importance of the old scourges of youth.

"It means, in spite of all that has been done in medicine in the last 20 years, that there is now a great unrest about medicine itself. Why? Because the aging section of the population is fearful and uneasy. It demands its ham and eggs and its thirty dollars every Thursday. It yearns, also, for free medicine—and the propagandist is quick to seize on that yearning.

"Security is the watch-word these days. But here is a curious and ironic fact; when we try to hand people security we defeat our own purpose. The truth is that we cannot give people real security. The only things that benefit any of us in the long run are the things that we get for ourselves.

Jittery Souls

"Did you ever notice the people who live on pensions or who hope to live on pensions? They are the most jittery souls on earth. They worry for fear they will not live long enough to enjoy their pensions and then they worry for fear the pensions will be taken away.

"We doctors know that, and we believe that in some things, such as illness, the people must be responsible for themselves. And, above all, that government cannot step in successfully and take that responsibility for us.

The Worse for All

"We believe that people should never be forced to go to doctors if they don't want to nor should they even be vaccinated and immunized against their will. If government does step in, assume that responsibility and enforce those measures, we believe it will be the worse for the patient and the worse also for medical progress.

"Of course, there are some special fields such as tuberculosis and mental disease in which we have welcomed government assistance. We know that government also serves an essential function in the control of public health.

A Different Story

"The story is entirely different, however, for the ordinary illness of the ordinary person. For these illnesses and for their own health, the responsibility belongs to the people themselves. And if the insurance principle should prove to be practical for payment of medical costs, then in these plans too the people should help themselves. We are already showing that it can be done in our hospital service associations and in our college health services. Certainly there is no reason why we should abandon the principle of self help simply because as a nation we are older than we used to be and are therefore subject to the fears and distresses of age.

Unselfishness for Age

"Perhaps the most important thing for any of us to learn is how to grow old gracefully. Courage and optimism and unselfishness are attributes of youth but they can be cultivated in age, as well.

"We must cultivate them in America if we are to avoid the unhappy consequences of our fears and especially if we are to keep the way open to medical progress in the United States."

REGULATING VITAMINS

Last week, the Food and Drug Administration got around to the vitamin industry.

Tentative regulations were set up covering vitamins from A to K and, if they go through, they are expected by *Business Week* to pare down the biggest slice of the fat vitamin pie—that is, the sales from the long-established and eminently marketable vitamin D, the “sunshine vitamin.” Hearings were scheduled for April 29.

The portion which is going to cause the major part of the shouting comes in one sentence requiring flatly that the labels of all foods making Vitamin D claims carry the statement: “When the skin is adequately exposed to direct sunshine, there is no established need for Vitamin D in the diet.”

Other telling points in the new regulations are:

1. All dietary foods, regular foods fortified with vitamins or minerals and so-called pharmaceutical concentrates, both of which come under the guns of the new regulations, must state on the label the dietary properties on which their claims are based.

2. Labels must tell whether recommended daily dose or serving comes up to the minimum vitamin requirements set up by the FDA.

3. If claims are based on a vitamin or mineral not yet established as necessary to human nutrition, labels must make this clear.

American Cult

Says *Business Week*:

“Whatever the outcome of the hearing set for April 29, FDA has bitten off a very sizable hunk to chew. In the past ten years, there has grown up in America what amounts to a vitamin cult, with its worshippers ranging from the Park Avenue socialite who pays her doctor \$25.00 a visit to find out that she has a B deficiency to the Montana cowboy who orders a package of capsules from Sears Roebuck or Montgomery Ward. Today, a good sized drug store stocks around 500 separate vitamin products. . . .

“Supplying the country with its A B C’s is an industry as complex as the vitamins it sells. A complete picture would include almost every big pharmaceutical house in the country, a fat slice of the food and cosmetic industries and any number of assorted concerns which manage to tie their advertising and promotion to the vitamin fad. Behind these are the companies which supply vitamins in bulk to the drug, food and cosmetic industries.

Millions for Vitamins

“Just how big the sales of vitamin concentrates and vitamin-impregnated foods are annually is not known.

A fair estimate, however, is that drug stores marketed \$56,000,000 worth of vitamin products last year. Sales of vitamin-impregnated foods probably pass that estimate. Vitamin concentrates and vitaminized cosmetics also move across department stores and are distributed by mail. And that does not take into consideration the tremendous sales of vitaminized food for animals and plants. Practically every chick in the country gets its ration of Vitamin D and Vitamin B tablets are on the market for the well-cared for garden.

Merck’s Acid of Life

“Some idea of the rapidity with which vitamins have forged ahead and of the complexity of the business the FDA is trying to regulate may be gathered from the fact that no less than five vitamins or factors of vitamins have been discovered or synthesized within the past few weeks. At least one of these, pantothenic acid, one of the mighty B complex, popularly known as ‘acid of life,’ has first class commercial possibilities. Option on the new vitamin is held by Merck whose chemists coöperated with Dr. R. J. Williams (brother of Bell Telephone Williams) in synthesizing it.”

Perles and Vitawater

The Vitamin Beverage Corporation is a new contender whose advertising for vitaminized Ginger Ale and Vitawater is just breaking in the national magazines. Incidentally, the head of this new corporation is also behind the U. S. Vitamin Corporations which sell Vi-Syneral to doctors and also the Dietetic Research Laboratories which sell vitamin and mineral “perles” on a “beauty-through-health” basis.

Seven Takers for “Health Insurance”

Most interesting of all, perhaps, is the brand new “health insurance” that the U. S. Vitamin Corporation is promoting in order to sell its Vi-Syneral in bulk to big corporations.

The idea is that employees are to get their vitamins in wholesale lots, employers and employees splitting the cost after the Social Security pattern. So far, says *Business Week*, James Burns, head of the corporations, claims seven-takers for the idea. And it appears also that U. S. Vitamin may expand still further if a vitamin-hormone product under their option which is now being tested in the Paris laboratory of Dr. Casimir Funk, is successful.

Still left to the FDA to consider are the vitaminized cosmetics which do not as yet come under their jurisdiction.

Actually, most of the big names in the vitamin business admit that when all of the tumult and

shouting and expense of revamping labels and formulæ are over, they will be glad the FDA stepped in.

AMA Is Only Check

The vitamin industry has not been notably successful in regulating itself and the more ethical producers have shuddered at practices which threatened to discredit good and bad alike. What small measure of control there has been has been exercised by the American Medical Association which has consistently opposed wholesale fortification of foods, drugs, and cosmetics, pointing out that the average adult gets all the vitamins he needs from a well-balanced diet and that cases of real deficiency are subjects for a doctor's care.

INTERESTING STATISTICS

(Monthly Editorial Prepared by the Medical
Advisory Committee)

A perusal of the malpractice cases brought against members of our Association during the last year and reviewed by the Medical Advisory Committee developed some interesting statistics.

Number one in the list of complaints is the fracture cases. Thirty-three per cent were brought as the alleged result of improper diagnosis and improper or poor treatment.

Your Committee recommends that the State Fracture Committee and the component county societies stress the matter of fracture treatment to the fullest during the coming year. There should be no let down in the study of this most dangerous of all fields from a medico-legal standpoint.

Number two is the complications of some forms of dermatitis. The misuse of the x-ray and other modes of applying light rays are the complaint.

Dermatological conditions are first seen by the general practitioner as a rule. If complications arise and the use of x-ray therapy is necessary, only those fully versed in its use should apply it. It is a dangerous instrument in unskilled hands.

Number three is the complications following tonsillectomies alleged to have been improperly performed causing loss of voice and so forth.

Tonsillectomy has become an every-day feat performed by the skilled and the unskilled. Ant-

icipated results are only obtained by close attention to the details of pre-tonsillectomy and post-tonsillectomy treatment, as well as a knowledge of the anatomy involved and proficiency in surgical performance.

Number four is the complications following intravenous and intradermal injections of various drugs: Neosalvarsan, "cold shots," varicose vein injections and so forth.

These have been unusually numerous this last year. This manner of treatment should not be considered lightly. Large amounts have been asked in damages in these cases.

Number five shows a miscellaneous number of other alleged wrongs committed by the medical man, for example: Negligent examination, improper talking, sponge left in wound, hernia following appendectomy.

This group shows the pitfalls of the general practice of medicine. Every case is a potential suit. Proper care of the patient by meticulous attention to details will avoid most of these. Again, we bring to the membership's attention, the curse of the unbridled tongue when discussing another man's work.

—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Quack Doctor Pays \$500.00 Fine in Minneapolis

Re: State of Minnesota vs. William E. McCoy
(2 cases).

On April 1, 1940, William E. McCoy, 35 years of age, and who holds no license to practice any form of healing in the State of Minnesota, pleaded guilty in the District Court of Hennepin County, to an information charging him with the crime of practicing healing without a basic science certificate. McCoy was fined \$500.00 by Judge W. W. Bardwell and which fine was immediately paid by the defendant. McCoy, on the same date, entered a plea of guilty to an information charging him with performing a criminal abortion on a 35-year-old divorced Minneapolis woman. On this charge, Judge Bardwell sentenced McCoy to a term of 4 years in the State Reformatory at St. Cloud, and the execution of this sentence was stayed for 3 years, upon condition that the defendant refrain from practicing healing in any manner in the State of Minnesota, and that he also refrain from engaging in any abortion activities. The complaint charging McCoy with practicing healing illegally, was filed by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, and was based on McCoy's maintaining an office for the practice of healing at 316 Masonic Temple Building, Minneapolis.

McCoy told the Court that he resided at 594 Ashland Avenue, St. Paul; he stated that he had no medical training of any kind, but got into the perform-

ing of criminal abortions through the National Health Service Bureau which McCoy formerly operated at 1591 University Avenue, St. Paul. McCoy, at that time, was engaged in the sale of a medicinal preparation at \$5.00 per bottle, which was advertised as being beneficial in cases of delayed menstruation. Apparently, the preparation was a failure for McCoy stated that he was soon engaged in the performing of criminal abortions. McCoy was arrested by the St. Paul Police Department in February, 1939, in connection with his operation of the National Health Service Bureau and finally was permitted to plead guilty to a violation of the State Pharmacy Law, for which he was fined \$50.00. In the present cases, McCoy was arrested in his office by members of the Minneapolis Police Department, on March 14, 1940, at which time his complete stock of surgical instruments and various medicinal preparations were confiscated. The Minnesota State Board of Medical Examiners approves of the manner in which the present cases were disposed of by the Court. Judge Bardwell made it very plain to the defendant that the Court was not imposing any fines in his case in the future, but that any unlawful activities on the defendant's part would result in a trip to the St. Cloud Reformatory. McCoy stated to the Court that he was absolutely finished with any such activities, and he will have no one to blame but himself if he is obliged to serve a prison term at St. Cloud. The Medical Board also wishes to acknowledge the splendid work done in these cases, and the coöperation given by the Minneapolis Police Department, and particularly by Lieutenant Blanche Jones and Mrs. Carrie Bystrom of the Women's Bureau.

* * *

Supreme Court Affirms Conviction of Minneapolis Physician

Re: State of Minnesota vs. George Frederick Lemke.

On January 26, 1940, the Supreme Court of Minnesota affirmed the District Court of Hennepin County in denying the defendant a new trial. The defendant was a duly licensed physician and surgeon in the State of Minnesota, until his license was revoked by the Minnesota State Board of Medical Examiners on February 11, 1939, for immoral, dishonorable and unprofessional conduct. Dr. Lemke was found guilty by the Medical Board of procuring, aiding and abetting a criminal abortion on a twenty-two-year-old Saint Paul girl. The girl was found dead in Dr. Lemke's office at 512 Pence Building, Minneapolis, on December 10, 1938. On February 25, 1939, Dr. Lemke was found guilty by a jury of the District Court of Hennepin County, of manslaughter in the first degree growing out of this case. He was sentenced by the Honorable W. W. Bardwell, Judge of the District Court, to a term of not less than five, and not more than twenty years at hard labor in a state penal institution. On May 17, 1939, Judge Bardwell denied Dr. Lemke's motion for a new trial, following which Dr. Lemke appealed to the Supreme Court of Minnesota. Following the Supreme Court's affirmation of the order of the District Court Dr. Lemke filed a petition for a rehearing, which was denied by the Supreme Court on February 28, 1940. Dr. Lemke was received at the State Reformatory at St. Cloud on March 1, 1940, to begin his sentence.

Dr. Lemke was born in Saint Paul, June 29, 1879, and graduated from the College of Physicians and Surgeons in Baltimore, Maryland, in 1906. He was licensed in Minnesota on June 26, 1908, by reciprocity with the State of New Jersey. Dr. Lemke was also licensed to practice medicine in the State of New York in 1907.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*

MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

Ramsey County

On March 25, the Ramsey County Medical Auxiliary held a regular meeting at the home of Mrs. John A. Moga, 948 Portland Avenue, Saint Paul. Miss Roselle Bezazian, pianist of the Summit School Music Department, played a program arranged by Mrs. G. Douglas Brand. Mrs. John J. Ryan, hospitality chairman, arranged the tea which followed. Mrs. Eugene Scott and Mrs. C. Harry Ghent poured.

The Auxiliary gave a Public Relations tea on Tuesday, April 2, in the Ramsey County Medical library in the Lowry Medical Arts Building. The presidents and secretaries of all women's organizations of Saint Paul were invited, in addition to the guests invited by the members of the Auxiliary. About 550 women were present.

Mrs. G. Douglas Brand arranged the program which included an address by Dr. William A. O'Brien, Associate Professor of Pathology and Public Health at the University of Minnesota, and the reading of the Broadway comedy "What a Life" by Mrs. Donald Bacon, a member of the Auxiliary. The following members assisted Mrs. Brand with arrangements: Mmes. John J. Ryan, E. V. Goltz, Lloyd Dack, Gordon R. Kamman, J. R. Aurelius, Bernard O'Reilly, and Mrs. C. Harry Ghent, president of the auxiliary.

Pouring tea were the former presidents: Mmes. Harry P. Ritchie, E. C. Eshelby, and William H. Hengstler.

* * *

A Last Reminder

Make your reservations now, for the 18th Annual Convention of the Women's Auxiliary to the American Medical Association to be held at the Hotel Pennsylvania, New York City, N. Y., June 10 to 14. New York has much to offer aside from the convention and you will not want to miss the opportunity of visiting New York this year.

* * *

CLIMATE IN TUBERCULOSIS TREATMENT

There are various conceptions as to what constitutes an ideal climate for the treatment of tuberculosis, but several authorities agree that certain climates are beneficial only to the extent that they permit patients to spend a maximum number of hours comfortably out of doors. A regimen of regulated rest and exercise, proper food and open-air life is considered to be the fundamental essential in the treatment of tuberculosis, and the part played by climate is believed to be subservient to the other more important considerations. Moriyama, I. M. and Herrington, L. P., *Amer. Rev. of Tuberc.*, March, 1939.

OF GENERAL INTEREST

Dr. Max Alberts of Saint Paul is chairman of the Minnesota State Medical Association cancer committee.

* * *

Dr. Herbert A. Carlson, formerly at Ah-Gwah-Ching, Minn., has gone to Minot, N. D., to practice.

* * *

Dr. Thomas E. Eyres of Pequot has recently moved into new office quarters where he has installed new x-ray equipment.

* * *

Dr. and Mrs. W. F. Nordman of Mora have returned from New York City, where Dr. Nordman recently completed a postgraduate course in medicine.

* * *

Dr. J. F. Karn, resident physician at Midway Hospital, has taken over the practice of the late Dr. T. J. Moynihan of Saint Paul, with offices at 2395 University Avenue.

* * *

A. TerLouw of Rochester, N. Y., addressed the University of Minnesota Hospitals general staff meeting, April 12, on the subject of medical movies, and the photographing of records.

* * *

Dr. H. T. Karsner, professor of pathology at Western Reserve University, will speak at the Mayo Clinic, May 23, on "The Relation of Certain Ovarian Tumors to Endocrine Disturbances."

* * *

Dr. Ellet de Berry, mental hygienist at the University Health Service, resigned several months ago to go to Sonora, Texas, where he is making his home on a ranch.

* * *

Dr. Owen H. Wangenstein, head of the University of Minnesota department of surgery, addressed a meeting of the Tacoma (Wash.) Surgery Society, March 23, on "Etiology of Acute Appendicitis."

* * *

Dr. Eva Jane Ostergren, who received her M.D. from the University of Minnesota in 1939, has become associated with her father Dr. E. W. Ostergren, in practice in Saint Paul.

* * *

Dr. Richard E. Scammon, long-to-be-remembered for his anatomy courses at the University of Minnesota, is now teaching two other courses in the Medical School: Measurement in Medicine and Medical Biography.

* * *

Dr. A. D. Prangen of Rochester delivered three lectures for the post-graduate course in ophthalmology at the George Washington University School of Medicine in Washington, D. C., in March. He also addressed the Washington Ophthalmological Society on "Some Salient Factors in Surgical Treatment of the Ocular Muscles."

Dr. Milan V. Novak resigned as instructor in bacteriology at the University of Minnesota Medical School, April 15, to go to Chicago as assistant professor of bacteriology at the University of Illinois College of Medicine.

* * *

Dr. R. V. Sherman, instructor in preventive medicine at the University of Minnesota, where he was also associated with health service, has gone to Red Wing to become associated in a clinic with Drs. R. H. Hedin and E. Jueres.

* * *

Dr. W. C. Alvarez of Rochester delivered the annual Clarence M. Jackson lecture, sponsored by Phi Beta Pi medical fraternity, on the University of Minnesota campus, April 26. His topic was "Functional Gastrointestinal Disturbances."

* * *

Dr. M. B. Visscher, chairman of the University of Minnesota department of physiology, will address the Northwestern Hospital staff meeting in Minneapolis, May 13, on "Physiological Aspects of the Problem of Shock."

* * *

Professor Thomas Addis of Stanford University Medical School will lecture on "The Treatment of Glomerular Nephritis," Monday, May 13, at 4:30 p. m. in the Medical Sciences Amphitheater at the University of Minnesota.

* * *

The National Tuberculosis Association has approved a grant of \$500 to the University of Minnesota for a study under the direction of Dr. Arthur T. Henrici of the Department of Bacteriology for an investigation of the acidfast actinomycetes in relation to tuberculosis.

* * *

Seven Rochester men addressed the recent meeting of the American College of Physicians in Cleveland, Ohio. They were Drs. A. W. Adson, E. V. Allen, A. R. Barnes, P. W. Brown, G. C. Morlock, G. B. Eusterman and L. E. Prickman.

* * *

Dr. A. W. Adson of Rochester addressed the Phi Rho Sigma medical fraternity's alumni banquet at the Minnesota Club in Saint Paul, April 20. The dinner commemorated the fortieth year of Theta Tau chapter, University of Minnesota.

* * *

Dr. Rene J. Dubois of the Rockefeller Institute for Medical Research has been given the John Phillips Memorial Award by the American College of Physicians. Dr. Dubois' work dealt with the effect of agents extracted from soil microorganisms upon experimental bacterial infections. The John Phillips Memorial Award is in memory of Dr. John Phillips who died in rescue work at the Cleveland Clinic disaster.

New at the University Health Service this year is Dr. John J. Boehrer, who received his M.D. from Johns Hopkins University in 1936 and was associated with Dr. F. H. K. Schaaf of Minneapolis prior to joining the Health Service staff.

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Dr. R. Schwyzer, former Blackduck physician, is now located in Bulack, Switzerland. He is surgeon in a hospital there. The doctor has a son who is now taking military training, as is required of all young men in that country.

* * *

Dr. Bernard A. Watson, physician in the Health Service and assistant professor of preventive medicine at the University of Minnesota Medical School, resigned May 1 to go to Battle Creek, Michigan, to be associated with the Battle Creek Sanatorium as head of the division of metabolism and endocrinology.

* * *

A series of five lectures, arranged by the University of Minnesota department of physiology, were presented in April by Professor Herbert M. Freundlich, university professor of chemistry. The lectures were concerned with phases of colloid chemistry of importance to biology and medicine.

* * *

A George Chase Christian Scholarship has been awarded for 1940-41 to Dr. John E. Skoglund, clinical instructor in the division of nervous and mental diseases at the University of Minnesota Medical School, for study in clinical neurology at the Harvard University Medical School.

* * *

Dr. Albert V. Stoesser, associate professor in the pediatrics department at the University of Minnesota, and Miss Marie Druckrey of Green Bay, Wis., were married April 27 in Shawano, Wis. After a wedding trip to Virginia and North Carolina, Dr. and Mrs. Stoesser will make their home in Minneapolis.

* * *

Five members of the University of Minnesota Medical School staff will go to Bozeman, Montana, to address the Montana State Medical Association, June 19 and 20. They are Drs. Cecil J. Watson, Ernest M. Hammes, N. Logan Leven, Walter A. Fansler and William A. O'Brien.

* * *

The board of directors of the American Society for the Control of Cancer includes two Minnesota men: Dr. William A. O'Brien of the University of Minnesota Hospitals, and Dr. H. E. Robertson of the Mayo Clinic, Rochester. Dr. O'Brien's term continues until 1941 and Dr. Robertson's until 1942.

* * *

The Franklyn R. Wright lectureship in urology will be given by Dr. Reed Nesbit of Ann Arbor, Tuesday, May 7, at 8:15 p. m. in the Medical Sciences Amphitheater at the University of Minnesota. His topic will be "Hypertension in Unilateral Renal Disease." The lecture is under the auspices of the Twin City Urological Society.

Dr. K. G. Wakim of the Mayo Foundation has been appointed acting professor of physiology at the Iowa State University, College of Medicine, for a six-months' period, January 1 to July 1, 1940. Dr. Wakim assumed the teaching duties of Dr. Harry M. Hines, who is doing special work at Cornell University.

* * *

Mayo Foundation Demonstration Day was observed at the Mayo Foundation House in Rochester, April 19, when apparatus, technics and various exhibits from all departments of the Mayo Foundation and the Mayo Clinic were displayed. Dr. E. J. Baldes was chairman of the committee arranging the evening program.

* * *

The Board of Directors of the John and Mary R. Markle Foundation has awarded Dr. Cecil J. Watson, Associate Professor and Director of the Division of Internal Medicine, University of Minnesota Medical School, a grant-in-aid of \$3,600, in support of Dr. Watson's studies of the significance of the excretion of various porphyrins.

* * *

Dr. J. de J. Pemberton of Rochester was elected president-elect of the American Association for the Study of Goiter at its annual meeting in Rochester, April 15-17. He will take office at next year's convention, which is tentatively scheduled to be held in Boston. Approximately 150 goiter specialists from the United States and Canada attended the sessions.

* * *

When the Minnesota Academy of Science held its eighth annual meeting on the University of Minnesota campus April 19-20, members heard Dr. A. J. Carlson, head of the department of physiology at the University of Chicago, speak on "The Physiology of Aging."

The Minnesota Neurological Society will meet May 11 in Rochester.

* * *

If you know of patients who have suffered injurious effects from the use of proprietary remedies containing desiccated thyroid, recommended or sold for obesity, or injurious results from indiscriminate use, of two grains or less of desiccated thyroid per day, please report such cases to the office of MINNESOTA MEDICINE, 2642 University Avenue, Saint Paul, Minnesota.

* * *

Dr. Henry E. Michelson of Minneapolis was among the speakers at the New Orleans Medical conference early in April, at which Dr. Rudolph Matas of Tulane University School of Medicine was honored for his fifty years of service in medicine. Approximately 1,200 physicians and surgeons from the South attended the three-day conference. Dr. Michelson gave the lectures in dermatology.

* * *

Representing the University of Minnesota at the decennial meeting of the Convention for the Revision of the Pharmacopoeia of the United States of America, May 14, in Washington, D. C., will be Dr. Raymond N. Bieter, associate professor of pharmacology, who

OF GENERAL INTEREST

will represent the School of Pharmacy; Dr. A. D. Hirschfelder, Dr. Harold Wright, and Raymond Amberg, superintendent of the University Hospital, who will represent the Medical School.

* * *

New laboratories of physiological hygiene have been opened at the University of Minnesota under the direction of Dr. Ancel Keys, the opening being marked by an "open house," March 28 and 29. The laboratories are complete with x-ray and fluoroscope for doing roentgen kymographs in connection with the heart. A motor-driven treadmill has been installed to serve as a measure for determining the amount of work done by athletes.

* * *

Expected to return about the first of June from Peiping, China, are Dr. Irvine McQuarrie, University of Minnesota professor of pediatrics, and Dr. Frank E. Burch of Saint Paul. Both have been visiting professors for the past six months at the Peiping Union Medical College, which is under the auspices of the Rockefeller Foundation.

Dr. McQuarrie will be back at the university for the first session of summer school.

* * *

Dr. C. M. Tangen of Canby has sold his practice to Dr. J. H. Raymond of Triumph, who will take possession July 1. Dr. Tangen, who started his practice in Canby in 1925, shortly after his graduation from the Medical School of the University of Minnesota, is leaving to accept a teaching fellowship at the University. He will spend three years in study to become an eye, ear, nose and throat specialist. After his work at the University he plans to take an additional year of training in New York.

* * *

Dr. B. R. Kirklin of Rochester addressed several scientific meetings while visiting in the South. On April 16, he addressed members of the Shelby County Medical society in Memphis, and the following day he addressed the meeting of the Northeast Mississippi Thirteen Counties Medical society in Tupelo, Miss. The following week he spoke at a meeting of the Louisiana State Medical Society in New Orleans, and on April 28, he addressed the Florida Radiological Society and the Florida Medical Association in Tampa, Fla.

* * *

More than \$20,000 has been subscribed to date to the Minnesota Medical Foundation, it was reported at the April meeting of the board of trustees.

According to Dr. Robert L. Wilder, secretary, membership as of April 10 included three patrons, eighty life memberships, fifty-six annual memberships, and 105 student memberships.

* * *

Dr. Erling S. Platou, president of the Foundation which was organized a few months ago, has announced plans for a more intensive program to increase the membership among alumni and friends of the University of Minnesota Medical School.

Recently transferred to the Minnesota Medical

Foundation treasury was a Medical School Endowment Fund of slightly less than \$1,000, raised through the efforts of the late Dr. Richard O. Beard for the support of medical research. Transfer of the fund was voted by the Board of Regents at the recommendation of Dr. Harold S. Diehl, Dean of Medical Sciences.

* * *

The fiftieth anniversary of Dr. C. O. Wright's entrance into the practice of medicine was observed Monday, April 1, 1940, by the Luverne Rotary club, of which the doctor is a member. Dr. Wright received his "license" to practice medicine on April 1, 1890, following his graduation from the medical school of the University of Minnesota, and immediately thereafter began practicing his profession in Montana, as a surgeon for the Northern Pacific railroad then engaged in building its line west from Missoula. Dr. Wright has practiced in Luverne for forty-one years.

A special program was prepared for the event, including a few appropriate songs and short talks by members of the club. The speakers paid tribute to the remarkably active and unselfish service rendered by Dr. Wright during his long residence in Luverne, both as a physician and a citizen who found his greatest happiness in rendering service to others and in aiding in the upbuilding of the community. The talks were naturally interspersed with the recalling of amusing incidents at the expense of the doctor, who has been a life-long devotee of hunting, fishing, golf and other sports.

* * *

Dr. Clarence P. Truog, who has been an instructor in radiology at the University Medical School, left April 1 to be associated with James M. Jackson Memorial Hospital in Miami, Fla.

* * *

Dr. Herman Jensen, formerly of Atwater and more recently in the University Medical School radiology department, has gone to Oakland, Calif., to be associated with Alameda County Hospital.

* * *

Dr. Mancel T. Mitchell, former medical fellow in obstetrics and gynecology at the University of Minnesota, is now practicing in Eau Claire, Wisconsin.

* * *

Dr. Robert Meyer, who was formerly professor and director of the pathological institute of the first women's clinic in Berlin before he fled Germany, is now an assistant professor of obstetrics and gynecology at the University of Minnesota, where he confines his activities to research in gynecological pathology.

* * *

Dr. Gerald T. Evans has been appointed associate professor of medicine in charge of laboratory service at the University of Minnesota Hospitals. He was formerly assistant professor of physiological chemistry at Yale University Medical College.

In Memoriam

Timothy J. Moynihan 1877-1940

Dr. Timothy J. Moynihan, for some thirty-three years a practicing physician in the Midway District of Saint Paul, died March 8, 1940, following a cerebral accident two days previous.

Born on a farm at River Falls, Wisconsin, May 19, 1877, he attended the local county school and later State Normal School at River Falls. He graduated from Hamline Medical College in 1906 and took his internship at Saint Joseph's Hospital in Saint Paul. In 1907, he became associated in practice with Doctors Cannon and Balcome in the Midway district of Saint Paul and later opened an office at Raymond and University Avenues.

Dr. Moynihan was on the staff of the Midway Hospital, Saint Paul, and Saint Mary's Hospital, Minneapolis. He was also a member of the Catholic Order of Foresters, The Modern Woodmen of America and the Phi Rho Sigma medical fraternity.

Dr. Moynihan was married in 1918 to Gladys Westphal, who, with a daughter Phyllis, survives him. He was preceded in death by a brother Jeremiah in 1898, and a sister Hannah Moynihan Robinson in 1931. Also surviving him are three sisters, Mrs. Carl Yocum and Mrs. Ellen Dean of Saint Paul and Mrs. John Clifford of River Falls. Two brothers, Humphrey Moynihan of Saint Paul and Dr. A. F. Moynihan of Sauk Center.

Dr. Moynihan was not ostentatious but was a true general practitioner and loved his life work. As godfather to the youth and advisor to adults he leaves a place in the hearts of his patients and friends which can never be filled.

Dr. Moynihan was a member of the Ramsey County Medical Society, the Minnesota State and American Medical Associations.

Lida Osborn 1875-1940

Dr. Lida Osborn, for nearly forty years a practitioner of medicine at Mankato, died at her home March 11, 1940, following an illness of several months.

Dr. Osborn was born in Mankato and graduated from high school there in 1894. She taught for one year at the East Mankato school and another year at the Union school, both in Mankato. She received her medical degree from the University of Minnesota in 1900 and returned to Mankato where she had since practiced. Postgraduate courses were taken later at the Children's Lying-In Hospital in Chicago after which she specialized in women's and children's diseases.

Dr. Osborn was one of the group of physicians who organized the first clinic in Mankato, but at the time of her death she was practicing alone. She was a member of the staffs of Immanuel and Saint Joseph's

Hospitals and at different times was chairman and secretary of the Immanuel medical staff. She was a member of the Blue Earth County Medical Society, the Minnesota State and American Medical Associations.

Dr. Osborn was active in the First Presbyterian Church of Mankato and at one time was superintendent of the Sunday school. She was also a member of the Mankato chapter of the National Federation of Business and Professional Women.

Dr. Osborn is survived by a sister, Eleanor, of Niswaga and a brother, Louis M. Osborn, an attorney at Virginia.

Henry Wireman Cook 1877-1940

Dr. Henry Wireman Cook, vice president and medical director of the Northwestern National Life Insurance Company of Minneapolis, died suddenly of a heart attack, April 25, 1940.

Dr. Cook was born in Baltimore, November 8, 1877. He received his A.B. degree at Johns Hopkins University in 1898 and his M.D. there in 1902. He was medical referee in New York for the Mutual Life Insurance Company of New York from 1903 to 1905.

Dr. Cook became medical director of the Northwestern National Life Insurance Company in Minneapolis in January, 1906, a position he continued to hold until his death. He was credited with being one of the first to appreciate the value of blood-pressure reading in life insurance examinations. From 1922 to 1927 and again in 1936 he was chairman of the disability committee of the American Life convention and in 1923 served as chairman of the medical section of that organization. He served last year as president of the Association of Life Insurance Medical Directors and officially represented that organization at the meeting of the International Life Insurance Medical Congress in Paris last May.

During the World War Dr. Cook obtained leave of absence from the Northwestern Life Insurance Company to serve with the American Red Cross in Washington.

Dr. Cook was a member of Nu Sigma Nu medical fraternity. He was a member of the Minnesota Academy of Medicine and of the Hennepin County Medical Society, the Minnesota State and the American Medical Associations. He was the author of numerous papers on medical and underwriting subjects and recently collaborated with his son, Henry W. Cook, Jr., in writing a book on medical impairments and other factors concerned in life insurance risks.

Dr. Cook is survived by his wife, Ellen Davenport Cook; two sons, Henry W. Cook, Jr., of Minneapolis and Charles D. Cook, student at Princeton University; two daughters, Virginia F. Cook and Mrs. H. Brewster Atwater of Wayzata; and four grandchildren.

Dr. Cook recently returned from a vacation in the South and his seeming good health only contributed to the shock his untimely death gave his many friends. A golf and bridge enthusiast, his sociability endeared him to a wide circle of friends. He exemplified a fine type of American gentleman.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR MAY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

- May 4—Functional Disorders of Feet
- May 11—Common Diseases of Feet
- May 18—Care of Feet
- May 25—Diseases of Teeth

AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

The twenty-fifth annual meeting of the American Association of Industrial Physicians and Surgeons, together with the first annual meeting of the American Industrial Hygiene Association, will be held at Hotel Pennsylvania, New York City, June 4, 5, 6, and 7, 1940.

This will be a four-day convention intensively devoted to the problems of industrial health in all of their various medical, technical, and hygienic phases, with particular stress on prevention and control of occupational hazards. Important programs have been prepared, and technical and scientific exhibits will be a feature of the convention. The dinner on Thursday evening, June 6, will be the occasion of the presentation of the Wm. S. Knudsen award for the year of 1939-40.

The medical profession is not only invited, but urged to attend these gatherings as they will be of unusual interest and value to all practitioners interested in industrial injuries and illnesses.

MINNESOTA ACADEMY OF OPHTHALMOLOGY

Dr. Erling W. Hansen of Minneapolis was elected president of the Minnesota Academy of Ophthalmology at a meeting in Minneapolis, April 12.

Other officers named are: Dr. William Kennedy of Saint Paul, first vice president; Dr. Theodore R. Fritsche of New Ulm, second vice president; Dr. George McGeary of Minneapolis secretary-treasurer; Dr. Henry Wagener of Rochester, chairman of the council; Dr. R. O. Leavenworth of Saint Paul and Dr. Kenneth A. Phelps of Minneapolis, members of the council.

The Academy will conduct a meeting in Rochester, May 10.

MINNESOTA SOCIETY FOR THE PREVENTION OF BLINDNESS AND CONSERVATION OF VISION

A concerted drive to eradicate preventable blindness is the aim of the recently organized Minnesota Society for the Prevention of Blindness and Conservation of Vision.

Incorporated under state charter "not for profit," the society, which has the endorsement of the Minnesota Academy of Ophthalmology, will serve as a fact-finding group and in an advisory capacity to already established organizations.

Officers are Mrs. Alfred F. Pillsbury, president; Dr. Egil Boeckmann, vice president; Louis W. Hill, Jr., treasurer; Dr. Frank E. Burch, secretary to the directors. Other directors of the society, which has offices at 503 Hamm Building, Saint Paul, are Mrs. Edwin White of Saint Paul; Rev. G. P. Sheridan of Rochester; Mrs. George W. Plant, Dr. Guy Stanton Ford, and Amos S. Deinard of Minneapolis; Edward Freeman of Virginia; J. C. Lysen of Faribault. Some forty men and women, who are outstanding in the state's medical, welfare and educational fields, are serving on its advisory committee.

Unendowed, the society is seeking small donations from Minnesota citizens for the support of its program, which is centered around the slogan, "Over one-half of all blindness is preventable." Donations may be mailed to the treasurer, Mr. Louis W. Hill, Jr., First National Bank Building, Saint Paul.

SAINT PAUL SURGICAL SOCIETY

Some 150 members and guests of the Saint Paul Surgical Society held an annual banquet, Thursday, April 11, at the Minnesota Club, Saint Paul.

The guest speaker of the occasion was Dr. R. W. McNealy, Associate Professor of Surgery, Northwestern Medical School, Chief Surgeon of the Wesley Memorial Hospital and Chief of Staff of the Cook County Hospital, Chicago. The subject of his address was "Perforation in Peptic Ulcer: a Critical Review in 700 Cases."

Representatives of the Duluth and Minneapolis Surgical Societies were guests. Dr. V. N. Peterson, president of the Saint Paul Surgical Society, presided. Dr. Logan Levin is secretary.

UNIVERSITY HOSPITAL EXECUTIVES MEET

Meeting on the University of Minnesota campus, April 12 and 13, members of the University Hospital Executives Council reelected its officers: President, Dr. Harley Haynes, director of University hospitals at the University of Michigan; secretary-treasurer, George Bugbee of Cleveland.

Twenty-six administrative officers from hospitals at

eight universities attended the two-day session. Represented were the Universities of Indiana, Minnesota, Rochester, Cleveland, Wisconsin, Chicago, Iowa and Michigan.

The program for training of residents and internes was discussed by Dr. Robin Buerki of Chicago, director of study on the American Hospital Association commission for graduate medical education. Other topics discussed during the meeting included student nurses in hospitals, personnel, and maintenance.

WASHINGTON COUNTY

At the regular monthly meeting of the Washington County Medical Society held at the Stillwater Club rooms, April 9, 1940, a number of announcements were made, and also reports from several committee chairmen. The proposed milk ordinance was brought before the meeting, discussed at length, and the Society recommended its adoption. Dr. F. M. McCarten, who was appointed to take the course presented at the University of Minnesota on the Care of the Premature and Newborn as a member from Washington County, gave a full and very good account, both at the medical staff meeting of the Lakeview Memorial Hospital on April 5 and before the regular meeting of the Washington County Medical Society on April 9.

The Society decided to show its appreciation to the physicians who had generously given of their time and knowledge by lecturing to the members during the past year, in the form of a stag dinner at the Stillwater Club on May 14. Those "golfily" inclined are invited to come to the Stillwater Golf Club at 2 o'clock in the afternoon where they will be welcomed by the following committee: Robert M. Burns, Carl L. Larsen, Frank J. Savage, Wilhelm von der Weyer and E. M. Jones, all of Saint Paul, and Royal C. Gray of Minneapolis.

WINONA AND WABASHA COUNTIES

The ninth annual joint meeting of the Winona and Wabasha County Medical Societies, and the fifteenth annual dinner tendered by the Buena Vista Sanatorium Commission to the physicians of the counties served, was held at the Sanatorium at Wabasha Monday evening, April 8. There were thirty-three in attendance, including physicians and members of the commission.

Dr. E. W. Ellis of Elgin, president of the Wabasha County Society, officiated as toastmaster.

Following the dinner, a program was presented, arranged by Dr. R. R. Hendrickson, superintendent and medical director of the sanatorium. Dr. B. S. Adams of Hibbing, president of the State Medical Association, gave an address on "Socialized Medicine," particularly in its application to plans for sickness and disability insurance.

Dr. Adams, not long ago, visited medical centers in

several European countries, where state controlled medical practice prevails, and he contrasted medical service there with that in the United States. He stated that medical and surgical equipment, hospital service, and conditions under which doctors work there were very poor as compared with the United States, and naturally, results of treatment were not nearly so good.

R. R. Rosell, executive secretary of the State Medical Association, described the plans and policies in the state regarding sickness insurance and medical relief work.

Dr. Hendrickson presented an able paper on "The Diagnosis of Tuberculosis."

After a vote of thanks to the sanatorium management, the meeting adjourned.

POSTGRADUATE COURSE IN OBSTETRICS

The Department of Obstetrics and Gynecology of the University of Chicago and the Chicago Lying-in Hospital are offering postgraduate courses of five to six weeks in obstetrics for practitioners during the next several months. The didactic part of the courses will be given for the most part by Dr. M. W. Boynton and Dr. J. H. Morton.

The first three periods will be: April 29 to June 8; June 17 to July 20; July 22 to August 24. The enrollment is small and the fee only \$15.00. Those interested may address inquiries as follows: Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association meets in Duluth on July 19 and 20, 1940.

Dr. O. W. Parker of Ely is president of the Society, and Dr. Clarence Jacobson of Chisholm, the Secretary.

The Program Committee consists of Drs. F. J. Hirschboeck and S. H. Boyer, Jr., of Duluth, R. N. Jones of St. Cloud, and O. O. Larson of Detroit Lakes, Minnesota.

STATE MEDICAL GOLF TOURNAMENT

The golf tournament held at Rochester, April 21, in connection with the State Medical Association meeting was won by Dr. C. Hunter Shelden with a low gross of 78; second low gross was obtained by Dr. J. W. Kernohan with a score of 81.

Numerous other prizes for least number of putts, lowest scores on the par 3 holes, the most 3's, 4's, 5's and 6's, et cetera, were given. The course was in excellent condition and although the day was rather cold and windy, the play was enjoyed by some thirty-five entrants. There were sixteen prizes donated by the commercial exhibitors.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of March 13, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, March 13, 1940. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 by the president, Dr. James Johnson.

There were thirty-one members and one guest present. Dr. Edward B. Churchill, of Boston, was a guest at this meeting.

The following men were elected as candidates on the University Membership list, Drs. Nordland and Cole acting as tellers: Dr. Harold S. Diehl, and Dr. M. B. Visscher.

The secretary read some proposed changes in the Constitution regarding the method of procedure in the election of new members. These will be published on the monthly program and voted on at a subsequent meeting.

The scientific program consisted of the following case reports:

BENIGN ADENOMA OF THE BRONCHUS

KENNETH PHELPS, M.D.

Minneapolis

Adenoma is the most frequent benign tumor occurring in the bronchial tree. This type of growth can now be recognized pathologically and is being more frequently diagnosed clinically. It is of importance because a cure is often possible.

Pathologically, these tumors are said, by some, to represent a congenital anomaly as the tumor has a marked resemblance to fetal lung. Others say they originate from the bronchial mucous glands. Some state the smaller bronchi have no such glands and therefore adenomas are found only in the larger bronchi.

Some compare them to the carcinoid tumors of the intestinal tract or to the mixed tumors of the parotid and do not classify adenoma as exclusively a benign tumor. Earlier pathologists were apt to diagnose this tumor adeno-carcinoma.

Microscopically, the epithelial covering is seen to rest on an intact basement membrane under which is a very vascular layer of loose connective tissue. This vascular layer is so characteristic that some call this tumor "vascular adenoma." The tumor consists of regular, cuboidal and cylindrical cells, arranged in solid columns or acini. They are uniform in structure and staining characteristics, contain round or oval nuclei and lack mitotic figures. Rarely does the tumor extend into the wall of the bronchus, but when this occurs complete eradication is considerably more difficult.

The lung parenchyma is never invaded and metastases do not occur.

Adenoma of the bronchus occurs more frequently (60 per cent) in women, between the ages of twenty

and forty. It grows slowly and the only symptom may be hemoptysis. In some women this occurs more frequently during the menstrual period. The characteristics of the hemoptysis are that its onset is sudden, without permonitory signs and it may cease as abruptly with no further streaking of the sputum.

A history of preceding attacks of pneumonia is common. Possibly, we may assume that the tumor caused obstructive atelectasis with pneumonitis resulting. The tumor, being so vascular, can change in size rapidly and succeeding attacks of atelectasis may follow.

Wheezing is frequently noted by the patient and has led to the diagnosis of asthma. Dyspnea may occur when the patient changes his position. If the tumor is on a long pedical it may shift its position and cause obstruction to a portion of the lung. This shifting may produce a wheeze in certain positions and not in others. Cough is quite constant.

Physical signs and x-ray findings may not be diagnostic, if the tumor has not reached a size which will obstruct the bronchus. However, the typical hemoptysis together with the other signs discussed above, should make one consider a diagnostic bronchoscopy. When the diagnosis can be established before the development of severe lung damage, due to chronic bronchial obstruction, a much better result can be obtained.

If the condition is unrecognized and untreated, obstruction of a bronchus will eventually occur. This means atelectasis, recurring pneumonitis, bronchiectasis, abscess or at times pyothorax. Bronchial obstruction is a definite indication for bronchoscopy, for both diagnosis and treatment.

Treatment consists of removing the tumor. If possible, this should be done through the bronchoscope. Punch forceps may produce considerable bleeding though electrocoagulation will help control this. A preliminary pneumothorax has been advised by some as a method of preventing blood from reaching the alveoli and causing aspiration pneumonia. Too vigorous cauterization may cause scar formation with stenosis of the bronchus resulting.

Radium applied locally or deep x-ray therapy have been used.

Surgical extirpation may be necessary particularly when the tumor has been long unrecognized and advanced pulmonary suppuration has resulted.

Case Report

Mr. R. B. H., aged twenty-seven, a conductor on the Northern Pacific Railroad, was referred to me by Dr. A. W. Ide, November 29, 1939.

The family history is negative.

The past history reveals that he has had two attacks of pneumonia, one in 1931 and the other in 1932. He coughed a little blood at this time. Following this, numerous telangiectatic areas appeared on his face and lips.

In April, 1934, he had a sudden attack of hemoptysis which cleared up rapidly. He was observed in the

Northern Pacific hospital and tuberculosis ruled out. The hemoptysis was considered to be from a bronchial varix—similar to those present in his mouth, cheeks, and lips.

In 1935, he coughed up a half glass of blood in three days, without fever or weight loss.

In May, 1939, a similar attack occurred, but the cough was worse and persisted. He raised yellow material until November, 1939, when he coughed up blood from four to five days—as much as a third of a tumbler full at a time. He now noticed a wheeze and a flapping noise when he coughed, which he localized on the right side. He was sent to the Northern Pacific Hospital in Saint Paul, for a bronchoscopic examination.

The chest radiograph gave negative findings.

The chest physical examination was negative except for the wheeze. His blood was normal. Blood pressure and urine were also negative.

Bronchoscopic examination: Blood was seen coming through the glottis and in the trachea. A tumor was seen in the right main bronchus. It bled very freely following the taking of a specimen for biopsy.

A diagnosis of benign adenoma was made by Dr. E. T. Bell.

On December 15, 1939, the tumor was completely removed by punch forceps and the base cauterized with 25 per cent silver nitrate.

The tumor was attached just to the right of the carina and was lying in the right main bronchus. It was about one and one-half centimeters in diameter.

Dr. Beach of Tacoma has written that he has seen the patient recently and he has had no recurrence of the hemoptysis and feels perfectly well.

Pathologists are not all agreed that this tumor is always benign.

A history of the recurring characteristic hemoptysis, wheeze, cough, together with the physical signs, x-ray findings, and bronchoscopic appearance should make an early diagnosis possible.

Bronchoscopic removal has resulted in many cures.

Discussion

DR. EDWARD D. CHURCHILL, Boston (by invitation): It is very kind of you to call on me and I wish I had more to add to this beautiful presentation by Dr. Phelps concerning this peculiar tumor. I can't add anything about its true nature and the pathologists and microscopists I work with are unable to solve the problem. They are puzzled concerning the histogenesis.

I suggested the idea of fetal lung rest to the pathologists but they do not agree with it. At the moment, Dr. Mallory thinks the tumor is more like the carcinoid that occurs in the intestine than any other neoplasm he knows about, yet he cannot demonstrate silver staining elements. Drs. Graham and Womak believe adenomas should be classified as so-called mixed tumors of the lung. Our pathologists do not agree with that. In San Francisco, Brunn and Goldman are drawing an analogy between this tumor and mixed tumors of the salivary glands.

I do not feel that these tumors are malignant in the sense that they are apt to metastasize or recur. They may show some cellular invasion of the surrounding lung, but we know that carcinoid tumors in the intestine may even show involvement of the adjacent lymph nodes and yet may exist for years without growth or spread.

The histories that Dr. Phelps gave are perfectly typical. It seems to me the importance of this tumor at the moment lies in putting it in a separate group from bronchogenic carcinoma. I don't care what it is called, so long as it is not confused with bronchogenic car-

cinoma. To do so will cloud the results of surgery and radiation therapy in carcinoma and they are already clouded enough now. The first adenoma I ran across I took out and reported it in the literature as carcinoma and have been busy retracting it ever since. Chevalier Jackson reported permanent arrest of a carcinoma removed through the bronchoscope; but his son, Dr. C. L. Jackson, has reviewed the case and believes it was an adenoma.

We find if we take the microscopically proven cases of cancer and the microscopically proven cases of adenoma, the proportion is about one adenoma to ten bronchial cancers. Now, if the many cancers that are not proven microscopically are included, it is probable that one out of twenty bronchogenic neoplasms will be an adenoma. But if we take the *respectable* bronchogenic tumors including cancer of the lungs, the tumors we can and have done something about surgically, these tumors make up about 25 per cent of the group. If I want to say adenomas are cancer, I can change my statistics about 25 per cent toward the better side because these patients, barring operative accident, are going to get well.

The only solution is to establish, as was done in bone sarcoma, a central tumor registry. The Association of Thoracic Surgery is working on such a plan. Adenomas may present themselves in the most bizarre way. The most striking case we have seen was a patient admitted to the hospital in coma because of veronal poisoning. He had taken veronal for sciatic pain. There were cough and hemoptysis, and the obvious diagnosis was cancer of the lung with metastases to the spine. He was ultimately discharged after lobectomy for adenoma of the bronchus and extirpation of a ruptured intervertebral disc, and is back at work. Neither diagnosis would have been possible ten years ago.

DR. JOHN F. NOBLE, Saint Paul: Speaking from the standpoint of pathologists, rather early in the game we made mistakes in the diagnoses of carcinoma of the lung. These mistakes have been made on cases of adenoma of the bronchus similar to the one just presented by Dr. Phelps. I think now, however, we have come to be able to spot these tumors at autopsy and perhaps at biopsy. I think the case just presented by Dr. Phelps is undoubtedly one of adenoma of the bronchus. The problem of diagnosis of carcinoma of the lung by biopsy is an extremely difficult one. So far, we have been fortunate in our experience in dealing with small biopsies of the bronchus and no serious errors have been made. Because of the extremely small size of the tissue submitted for examination, it is possible to have metaplasia of such a degree that a mistaken diagnosis of malignancy might be made.

We had at the Ancker Hospital a girl in her early twenties on whom I made a diagnosis of carcinoma of the lung. At that time she was extremely ill with pulmonary sepsis but following the biopsy her pulmonary infection improved and she was able to return to work. She was not seen again for eighteen months when she was examined by another physician. She was a picture of health, and the x-ray films of the chest showed a marked clearing of the atelectasis. The patient was presented at another hospital staff meeting, and I was fearful that a serious error had been made. After the patient was sent from the room, however, the physician admitted that the patient had again lost ten to fifteen pounds from her top weight, and that she was showing x-ray evidence of recurring atelectasis. The last of that story is not told, but I feel certain that the patient has a carcinoma of the lung.

Sooner or later, however, errors of diagnosis on biopsies of the bronchus are bound to be made because of the character of the material submitted for examination. I think that an accurate diagnosis of the tumors of the bronchus by biopsy depends upon an extremely close relationship between the surgeon, the bronchoscopist, and the pathologist.

Dr. E. M. Hammes, Saint Paul, gave the following case report and presented the patient.

THE SCALENUS SYNDROME: BRACHIAL PLEXUS NEURITIS

E. M. HAMMES, M.D.

Saint Paul

A unilateral brachial plexus syndrome of non-traumatic origin always presents an interesting diagnostic problem. Enlarged cervical ribs, metastatic involvement of the cervical vertebrae, hypertrophic arthritis of the spine, cervical hypertrophic pachymeningitis due to syphilis, syringomyelia, cord tumor, are among the possible etiologic factors. The typical syndrome of an elongated cervical rib is frequently encountered. It usually begins in middle adult life, with a heavy dragging sensation in the shoulder, pain over the deltoid extending down the arm, with weakness of the musculature, some atrophy of the intrinsic hand muscles with sensory disturbances, especially in relation to the ulnar nerve, with a slow progressive course until the extremity becomes practically useless. Associated with this may be other trophic changes, vasomotor disturbances, and a difference in the blood pressure of the two sides. Roentgenologic studies reveal an elongated cervical rib as the causative factor. Occasionally, this symptom group is encountered in patients in whom x-ray studies do not reveal a cervical rib. Naffziger and Grant, in the journal, *Surgery, Gynecology and Obstetrics*, December, 1938, report eighteen such cases and suggest the term "Scalenus Syndrome." In the literature to that date, fifty-one similar cases have been reported. The authors believe that, "the etiology consists largely in anatomical and developmental factors that result in an abnormal position of the shoulder girdle in relation to the thoracic cage. Embryologically, a postfixed brachial plexus is more readily subjected to tension and angulation in its course over the first rib and behind the anterior scalenus muscle. Injury, excessive occupational strain, or poor musculature, may cause the shoulder to droop and precipitate the signs and symptoms."

Myotomy of the scalenus muscle frequently produces excellent results, even in long-standing cases.

Case Report

This patient presented four outstanding symptoms:

1. Slow progressive weakness of the left arm with atrophy of some of the intrinsic hand muscles.
2. Pain and tenderness in the left supraclavicular space extending down the arm and hand.
3. Sensation in the left side of the neck as if "cords were tight and short."
4. At times, the left arm feels full and swollen, especially when she is lying down. This sensation disappears when the arm is elevated and a feeling develops as if blood were rushing into the arm.

The patient is a female, aged forty-two, who was referred to us by Dr. F. V. Langenderfer on February 19, 1940.

Her family and personal history were negative except that her right hand is deformed due to a burn at the age of eighteen months. Because of this, she per-

forms most of her heavy work with the left hand, such as husking corn, carrying heavy milk cans, and other farm work.

Her present complaint began in 1931, nine years ago. At that time she noticed numbness, pain, paresthesia, and weakness of the left thumb. This continued for three months, then disappeared completely for six months. The condition recurred and also involved the palmar surface of the second and third fingers. The pain gradually extended up the extensor surface of the entire arm to the tip of the shoulder, and the entire arm tired easily. This continued for four years. She then developed a sensation as if the cords in the left side of the neck were too short and tight. The muscles around the left thumb began to waste and the weakness in the arm became more pronounced. These symptoms continued off and on until October, 1939, when they became more pronounced. She now is unable to pick up objects with her left hand, to button her clothes, or do any heavy work. The pain is more pronounced. The arm feels big and swollen, especially after she goes to bed and is quiet. When she moves it about or elevates it, she has a sensation as if blood were rushing into it.

The physical examination was negative except for a deformed right hand.

The neurologic examination is negative except for her left arm. Pupils, fundi, eye movements, and other cranial nerves are normal. The right upper extremity is normal throughout. The left upper extremity possessed normal muscle strength in the left upper arm with apparent weakness because she said it pained in the elbow when she held the arm against resistance. Movements at the wrist were good. The biceps, triceps, and perist reflexes are normal. She had atrophy of the thenar, adductor pollicis, and slight atrophy of the interossei muscles in the left hand. The grip, with the dynamometer, in the left hand was 42. We were unable to test the right hand because of the deformity. Sensation was normal over the entire left arm to the wrist. From the wrist down on the palmar surface of the hand, including the inner portion of the thumb, pain and tactile sense were impaired. On the dorsal surface of the hand sensation was normal except over the distal phalanges of the first three fingers where touch and pain sense were impaired. She had marked tenderness in the left supraclavicular region and over the entire left arm, but there was no definite nerve-trunk tenderness.

Her hemoglobin is 80 per cent; blood pressure, left arm 126/74, right arm 124/76; urine normal. The blood Wassermann reaction was negative.

The spinal fluid was clear and 6 c.c. were removed. The pressure was 180 mm. of water, which rose promptly to 350 with jugular compression, with prompt return to 180 when the pressure was released. It contained one cell, a trace of globulin, a negative Wassermann, a negative colloidal gold curve, 1111100000, and quantitative protein 30 mgms.

X-ray examination of the cervical spine and the left shoulder region was negative. There was no evidence of cervical rib or arthritis.

A diagnosis of scalenus syndrome was made and a myotomy of the scalenus muscle will be done next week.

* * *

Addenda: This patient was operated on by Dr. W. C. Carroll at St. Joseph's Hospital, on March 26, 1940. The left scalenus anticus muscle was markedly hypertrophied and tense, and was severed. Within forty-eight hours the patient stated that the pain in the shoulder and arm had definitely improved, and the fullness and congested feeling have subsided. She should make a complete recovery.

SARCOMA OF THE ULNA; LATE RESULTS

ARNOLD SCHWYZER, M.D.
Saint Paul

Dr. Schwyzer reported a case of swelling of the lower end of the right ulna which proved to be giant cell sarcoma. Resection of the ulna in June, 1916, and insertion of a piece of tibia. Late results reported. Movements free, arm strong, no complaint. Radiographs show good transformation of the transplant into tubular bone. Full report of the case will be given later.

CONGENITAL HEMOLYTIC ANEMIA WITH SPLENECTOMY

Case Report

MARTIN NORDLAND, M.D.
Minneapolis

Congenital hemolytic anemia is a chronic, hereditary disorder in which blood destruction over-balances blood formation, with resultant icterus, anemia and splenomegaly. It is generally agreed that heredity plays a great part in the etiology, most of the cases being inherited according to Mendelian law, and that the increased blood destruction is dependent upon increased fragility of the red blood cells. It has been observed, however, that in a number of mild cases the fragility test was normal.

The case report here submitted is that of a white, unmarried female, forty-four years of age, admitted to the hospital on September 12, 1939. Her presenting complaints were: (1) intermittent attacks of jaundice for the past twenty years; (2) intermittent spells of anemia for the same period; (3) severe upper right quadrant pain for ten days prior to admission to the hospital; (4) irregular spells of digestive distress associated with ingestion of fatty foods; and (5) recent complaints of frequency, nocturia, and some dysuria.

The patient had a thyroidectomy with uneventful recovery in 1937. The past history otherwise was negative except as stated above.

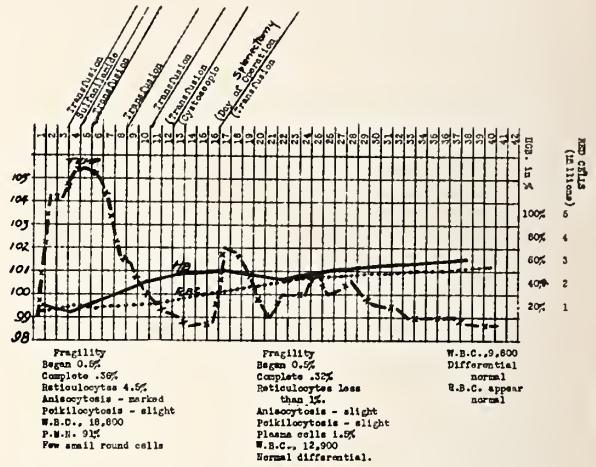
Physical examination of the patient revealed a fairly well-nourished, well-developed, white, but icteric appearing female of about the stated age, who was not in acute distress. Her sclerae were icteric and the pupils reacted to light and accommodation. The throat was clear but the mucosa was yellowish tinged. The lungs and heart were normal. The blood pressure was 128/68. Abdominal examination revealed no unusual tenderness, the liver was not palpated, but the spleen was felt four fingers (8 cm.) below the costal margin in the left mid-axillary line.

Blood examinations on admission showed a hemoglobin of 32 per cent, red blood cells 1,610,000, with a majority of spherical microcytes. There was a color index of 1.1 and a reticulocyte count of 4.5 per cent. Fragility was increased by 25 per cent.

Because of the history and the findings recorded above, a diagnosis of congenital hemolytic anemia with jaundice and an associated cholelithiasis was made.

However, the situation suddenly became serious and confusing. Two days after admission the patient's temperature jumped to 104° and for six days the temperature fluctuated rapidly between 99° and 105.6°. A catheterized specimen of urine was found to be loaded with pus cells. Albumen was present 2 plus. There were a few r.b.c., and a culture of this urine showed *B. coli*. The hemoglobin which was recorded 32 per cent on admission, September 12, 1939, had dropped to 26 per cent by September 16 (Fig. 1). On

cystoscopic examination, September 23, 1939 (11th day) the patient was found to have a marked cystitis with the kidneys apparently free from pus, but culture showed *B. alkaligenes*. From roentgenological ex-



HEMOLYTIC JAUNDICE WITH ANEMIA
PYLOREPTICUS OF ADMITTANCE

Fig. 1.

amination, following the retrograde pyelography, the following conclusions were drawn: enlargement of the right kidney with normal renal pelvis, marked enlargement of the liver and spleen with the enlarged spleen pushing the kidney down and medialward and thus distorting the pelvis. There were also multiple calcified gallstones (Fig. 2).

The patient was placed on a regime of multiple transfusions of citrated blood. In spite of the low hemoglobin (25 per cent) and the jaundice, the patient was given sulfanilamide by Dr. Ulrich. This therapy was followed by marked improvement and within four days the temperature had become normal, the pus had disappeared from the urine and the hemoglobin was elevated to 49 per cent.

By September 28, 1939 (16 days after admission) the patient was physically fit for splenectomy, which was then considered the treatment of choice. Five hundred c.c. of citrated blood was administered to the patient preceding the operation. Under gas and ether anesthesia, a splenectomy was performed. The spleen was found to be widely attached to the cardiac portion of the stomach, the splenic flexure of the colon and to the diaphragm. This caused considerable trouble in its removal. To assist in the displacement of the spleen, the table was sharply tilted so that the head was considerably higher than the feet. Fifteen minims of epinephrin was injected into the splenic artery immediately preceding the application of the ligature to this vessel. Application of the ligature to the splenic vein was delayed about 60 seconds to permit thorough emptying of the blood contained in the spleen into the general circulation. Four transfusions of 500 c.c. each of citrated blood were given on alternate days following the operation.

The spleen was 23 cm. in length and 16 cm. in diameter following excision (Fig. 3). Its shape was normal; weight was 1,450 grams. On cut surface it was chocolate-colored and firm without much free blood. The corpuscles were somewhat less numerous and less distinct than in the normal and on microscopic section there were marked numbers of erythrocytes throughout the spleen with a reduction in number of splenic corpuscles. On the 25th postoperative day the patient was discharged from the hospital.

Laboratory findings showed hemoglobin 65 per cent, r.b.c. 2,950,000 per cm., color index 1 plus, reticulocytes less than 1 per cent, and the fragility of the erythrocytes apparently unchanged.



Fig. 2.

The correct diagnosis in almost all cases of congenital hemolytic jaundice should be made by the presence of icterus with splenomegaly, associated anemia, increase in the number of polychromatophilic red cells and reticulocytes, and increased fragility. Most mistakes are made in the mild cases. Splenectomy is quickly beneficial in the severe cases; relief of symptoms is usually permanent. The operative mortality is variable in different clinics but should not be high. There is a rapid postoperative return of the red count to normal because of the speedy regeneration of the red blood cells. Occasional cases may require cholecystectomy as well.

Discussion

DR. H. L. ULRICH, Minneapolis: There are several items which could be stressed in this case. It is not a glaring mistake to make a diagnosis of cholecystitis in the presence of hemolytic jaundice. Sixty per cent of the cases present this complication. A bedside diagnosis could be made on this patient with the physical findings and history. The urgent thing, she was so very ill. Urinary antiseptics had been given. A transfusion had not made any difference. In fact, these cases do not take transfusions very well. Having seen a report of a case of neutropenia with sepsis which responded to sulfanilamide, we thought we would use it for her bladder infection. Her hemoglobin was at its lowest and the temperature was at the highest. Giving sulfanilamide to a patient with a hemoglobin of 28 per

cent is a rather drastic procedure. Then there was her jaundice. The liver was under pressure trying to excrete the enormous amount of bilirubin being delivered to it. Liver insufficiency is another contraindica-



Fig. 3.

tion in the use of sulfanilamide. We were traveling on thin ice. But the response was most favorable. Her urine cleared up. Her temperature came down and her hemoglobin and reds began to rise.

We did not see the spleen contract at the time of the operation when adrenalin was injected into the splenic artery. It may have been that we did not wait long enough or it may have been due to the extensive adhesions of the splenic capsule. No blood examination was made before or just after the adrenalin injection. The cholelithiasis and cholecystitis can be taken care of when this patient has rehabilitated her blood following the splenectomy.

MULTIPLE TUMORS OF THE TESTICLE

GILBERT THOMAS, M.D.

Minneapolis

Dr. Thomas gave a report on the above subject.

Discussion

DR. J. C. LITZENBERG, Minneapolis: I would like to ask Dr. Thomas one or two questions. In testicular tumors, have you any figures to show the percentage that gave the positive hormone test for chorion epithelioma?

DR. THOMAS: No, I haven't. I have a report now on my desk, by a urologist in New York. In this paper the doctor describes the chorion epithelioma but does not include a complete bibliography.

DR. LITZENBERG: Theoretically, one should not get a positive hormone test unless there is chorion epithelioma present. If the prolan test is positive, chorion epithelioma must be present.

DR. H. L. ULRICH, Minneapolis: Some years ago (it was when Dr. Berglund was with us) we had a patient—a young man—in the University Hospital, who had numerous cysts of the lung. There was a good deal of speculation regarding these growths. It was not until some one pulled down his bed clothing and examined his testicles that it was noticed he had a teratoma on one of them. This explained the origin of the cysts very conclusively.

The meeting adjourned.

A. G. SCHULZE, M.D., *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

COMPENDIUM OF REGIONAL DIAGNOSIS IN LESIONS OF THE BRAIN AND SPINAL CORD. 11th Edition. Robert Bing, Professor of Neurology, University of Basel, Switzerland. Translated and edited by Webb Haymaker, Assistant Clinical Professor of Neurology and Lecturer in Neuro-Anatomy, University of California. 292 pages. Illus. Price, \$5.00, cloth. St. Louis: C. V. Mosby Co., 1940.

CANCER IN CHILDHOOD and a Discussion of Certain Benign Tumors. Harold W. Dargeon, M.D., F.A.A.P. Attending Pediatrician, Memorial Hospital for Cancer and Allied Diseases, New York; Associate Pediatrician St. Luke's Hospital, New York; Associate Pediatrician New York Foundling Hospital; Instructor in Pediatrics, College of Physician & Surgeons, Columbia University. 114 pages. Illus. Price, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1940.

INTRODUCTION TO MEDICINE. Don C. Sutton, M.S., M.D. Associate Professor of Medicine, Northwestern University School of Medicine; Attending Physician, Medical Division of Cook County Hospital; Chief of Cardiac Clinic, Cook County Hospital, Chicago; Attending Physician, Evanston Hospital. 642 pages. Illus. Price, \$3.25, cloth. St. Louis: C. V. Mosby Co., 1940.

CHEMOTHERAPY AND SERUM THERAPY OF PNEUMONIA. Frederick T. Lord, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School; Member of Board of Consultation, Massachusetts General Hospital; Elliott S. Robinson, M.D., Ph.D., Director Division of Biologic Laboratories, Massachusetts Department of Public Health; Roderick Heffron, M.D., Medical Associate, the Commonwealth Fund; Formerly Field Director Pneumonia Study and Service, Massachusetts Department of Public Health. 174 pages. Illus. Price, \$1.00, cloth. New York: Commonwealth Fund, 1940.

LET'S TALK ABOUT YOUR BABY. H. Kent Tenney, Jr., M.D., F.A.A.P. Associate Professor of Pediatrics, University of Wisconsin Medical School, Associate Pediatrician to State of Wisconsin General Hospital. 115 pages. Illus. Price, \$1.00, cloth. Minneapolis: University of Minnesota Press, 1940.

SYNOPSIS OF OBSTETRICS. Jennings C. Litzenberg, M.D., F.A.C.S. Professor Emeritus of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis. 394 pages. Illus. Price, \$4.50, flexible binding. St. Louis: C. V. Mosby Co., 1940.

THE KOSHER CODE of the Orthodox Jew: Being a literal translation of that portion of the sixteenth century codification of the Babylonian Talmud which describes such deficiencies as render animals unfit for food (Hilkot, Terefot, Sulhan Aruk); to which is appended a discussion of Talmudic anatomy in the light of the science of its day and of the present time. By S. I. Levin, Senior Rabbi of Minneapolis and Edward A. Boyden, Professor of Anatomy, University of Minnesota. Cloth. Price \$4.50. 243 pages. Illus. Minneapolis: The University of Minnesota Press, 1940.

The subtitle tells exactly what this book consists of in its scope and purposes. It is a work of great historical and scientific value; one which may be read with

interest and profit by all who seek to be better informed about the close intertwining of the development of religion and medicine. How Dr. Boyden came to become interested in this particular phase of the subject is told by him in the preface. It was when he was engaged in examining some ten thousand vertebrate livers in the abattoirs of Boston that he met "kosher cutters" from the local synagogues, who told him that such anomalies as he was seeking could be found described in the latest codification of the Babylonian Talmud, published in Venice in 1564. This greatly aroused his curiosity and he spared no effort to "follow through" and secure authentic information, all of which confirmed what he had been told and finally resulted in this masterly piece of collaboration with Rabbi Levin.

More than most languages, the Hebrew and the Amharic contain many words which have a double meaning and many somewhat similar words which have exactly opposite meanings. This reviewer knows of many instances, for example, in the Old Testament where failure on the part of the translators to appreciate this has caused many errors to creep in and change the whole meaning of the context. In the present instance the translators have exerted every effort to preserve the literal meaning of every word, often very difficult for the reasons given and for the further one that sometimes there is no adequate equivalent in English. The result is an excellent piece of work, for the completion of which we congratulate both of the scholarly translators and annotators in what must have been a most exacting task.

GILBERT COTTAM, M.D.

SKETCHES IN PSYCHOSOMATIC MEDICINE. Smith Ely Jelliffe, M.D., New York. 155 pages, including an index. Price \$3.00. New York: Nervous and Mental Disease Monographs (64 W. 56th Street), 1939.

This small book consists of a series of reprints and addresses given by the author at various times. The style is discursive and the language may be somewhat confusing to those not familiar with psychoanalytic terms. An indication of the style is found in Dr. Jelliffe's own comment: "As a matter of history I can recall a comment once made by my brother who, listening to me talk when a young man, said that he often held his breath wondering if I would come out all right in my sentence before I got through."

The writer attempts a broad approach to medical problems from the viewpoint of evolution and psychoanalysis. He searches for the meaning, in a general and philosophical way, of human ailments. For example: "Any deviation from Object or Aim (in the Unconscious) is capable of causing disorder or disaster in the delivery of the energy of the human being either at the level of metabolism or at the level of conduct, or both. At the conduct level such disorders or disasters are of social significance chiefly and are dealt with chiefly by legal agencies as antisocial, criminal or delinquent conduct, or by medicine as psychoses and certain psychoneuroses. At the metabolism level, organ disturbances result."

An idea of the contents of the book may be obtained by glancing over the chapter headings.

I. What Price Healing?

The author points out the necessity for concomitant psychotherapy along with surgical treatment of some ailments.

II. Psychopathology and Organic Disease

Any deviation from object or aim threatens the harmonious action patterns within the machine.

III. The Death Instinct in Pathology

The author attempts to explain in Freudian terminology, recovery from mental illnesses following severe somatic illnesses or severe operations.

IV. Dupuytren's Contracture

This chapter contains an interesting historical account of Dupuytren's contracture. The author attempts to point out the significance of "strong grasping tendencies."

V. The Psyche and the Vegetative Nervous System

This is an attempt to evaluate the significance of mental factors in the endocrine disorders, especially hyperthyroidism.

VI. Bodily Organs and Psychopathology

This chapter contains an interesting brief developmental history of psychoanalytic psychiatry.

VII. The Skin, Nervous System and the Bath

This skin is discussed from the evolutionary standpoint, starting with the ameba. Eczema and psoriasis are given most attention.

VIII. Neuropathology of Bone Disease

The author reports a case which is supposed to show the relationship of emotional tension, due to unconscious motivation and development of a giant cell tumor of the lower end of the tibia.

IX. Psychoanalysis and Myopia

This chapter is a discussion of the psychological meaning of the development of myopia in the adolescent.

X. The Ecological Principle in Medicine

This is a brief dissertation on "the adaption of man as a whole to the whole of the cosmos."

The author defines the Neo-Hippocratic physician as one who is not satisfied with the chemical explanation alone, nor biologic nor purely psychologic, but searches for all three. If one has the time and wishes to use it for close study of the material in this book, he is almost certain to increase his breadth of vision in psychosomatic medicine. The problems raised are of great interest and the author's contentions are engaging, but they suffer from lack of genuine proof and close reasoning.

ALEX BLUMSTEIN, M.D.

FUNCTIONAL DISORDERS OF THE FOOT; THEIR DIAGNOSIS AND TREATMENT. Frank D. Dickson, M.D., and Rex L. Diveley, M.D. 305 p. Illus. \$5.00. Philadelphia: J. B. Lippincott Co., 1939.

This book is one which every practicing physician should own. Painful feet are a cause of so much dis-

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, *AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES*, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

ability and the complaint is so common that there are few doctors who are not consulted almost daily by their patients for this reason. Without going into the evolution, anatomy and physiology of the feet more than is necessary for an intelligent approach to the more practical side of functional disorders, the authors give enough of these subjects to allow the general practitioner who uses the book to handle many of his cases without requiring orthopedic consultation.

The subjects of imbalance and of proper shoeing are so adequately covered that a full understanding of these chapters will allow one to treat with confidence the large majority of cases seeking relief. The less common ailments are also thoroughly covered and their discussion rounds out a book which is certainly an outstanding one on the subjects treated. It can be unqualifiedly recommended to anyone with an interest in foot disorders.

WALLACE H. COLE, M.D.

SHOCK. BLOOD STUDIES AS A GUIDE TO THERAPY. John Scudder, M.D., Med. Sc.D., F.A.C.S. 315 pages. 55 illustrations. 5 plates (3 in color). Philadelphia: J. B. Lippincott Co., 1939.

This book is primarily concerned with the results of a new treatment of shock. It brings out the importance of potassium in the etiology of shock and emphasizes the blood changes which take place in this state. It presents the different theories of shock and also the present-day types of treatment of this condition. This portion is a beautifully condensed summary of the different methods of treatment and an evaluation of them. The author then presents in detail experiments illustrating hemo-concentration and changes in potassium in experimental shock. He stresses the importance of the determination of cell volume, specific gravity of whole blood, specific gravity of plasma, amount of plasma proteins and includes as a supplement a concise laboratory manual for determination of this data. He then includes detailed blood studies in 28 cases of post-operative shock, shock due to trauma alone, shock due to trauma complicated with hemorrhage, shock due to hemorrhage, shock due to burn, shock due to perforated duodenal ulcer and primary shock. Treatment with suprarenal cortex is then discussed. He includes at the end three historical and chronological sketches on developments in the conception and treatment of shock, developments in the physiological and toxicologic effects of potassium and developments in some of the functions of the adrenal glands.

The bibliography contains 533 references. A very interesting feature is the insertion of blank pages at various points for additional notes of the reader.

Although this book contains a great deal of experi-

mental data, which might prove somewhat laborious for the casual reader, the résumé of the whole subject of shock is so concise and informative that it is well worth a close study. It will prove of value not only to those interested in the experimental side of shock but also to those who are of necessity more interested in the practical side.

WALLACE P. RITCHIE, M.D.

ELECTROCARDIOGRAPHIC PATTERNS — THEIR DIAGNOSTIC AND CLINICAL SIGNIFICANCE. Arlie F. Barnes, M.D., The Mayo Clinic, Rochester, Minnesota. 197 pages. Illus. Price \$5.00. Springfield, Illinois: Charles C. Thomas, 1939.

The voluminous contributions to the current literature of recent years on electrocardiographic changes incident to myocardial effects associated with many clinical conditions has made welcome Dr. Barnes' monograph. No attempt is made to discuss the fundamentals of electrocardiography on the subject of arrhythmias which have been amply covered by previous publications. However, in this treatise the author has brought together in an orderly fashion, well illustrated, the significant contributions to this field, many of which are the results of his own investigations.

The combinations of alteration from the normal of the contours, voltage and time relations of the usual electrocardiographic leads are designated as patterns. These patterns have been described as quite definite indications of the presence of certain clinical conditions. Most important of these is coronary vascular occlusion, the patterns of which are well described in both the acute and chronic forms. Of particular interest are the author's descriptions of the patterns seen in conditions putting undue strain on one or the other ventricle, and his evidence indicating that they are due to metabolic factors incident to the strain rather than actually demonstrable changes in the myocardium.

The descriptions of the patterns seen in pericarditis and the effects of various drugs, metabolic disorders and infections on the electrocardiogram are especially important in that they call attention to the fact that such changes can occur. They show how the records may lead to consideration of these conditions, otherwise unsuspected.

It is unfortunate that the illustrations of the fourth lead could not be given as taken with the technic recommended by the Committee for the Standardization of Precordial Leads. This cannot be regarded as a serious criticism, but rather the penalty any monograph must pay in presenting a subject in which knowledge is advancing so rapidly.

JOSEPH F. BORG, M.D.

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ORGANIZED MEDICINE AND INDUSTRIAL HEALTH*

C. M. PETERSON, M.D.

Secretary, Council on Industrial Health
American Medical Association
Chicago, Illinois

MEDICAL interest in the effects of occupation and environment on health has existed for a very long time. Yet only occasional efforts at improvement took place in this country until about thirty years ago when new concepts regarding responsibility for health conservation among industrial workers began to exert very profound influences upon industry and upon the medical profession. The first in importance was the enactment of workmen's compensation legislation. Once a monetary value was placed on disability arising out of or in the course of employment, it did not take industry long to realize that industrial accidents and occupational disorders are to a very considerable degree preventable. Furthermore, it has been repeatedly demonstrated that health maintenance and proper working environment applied to the worker have very definite favorable effects on rates of industrial production. It is upon considerations such as these that our modern interest in industrial health fundamentally rests.

The private practitioner of medicine, specialist or not, provides 80 per cent of the medical service which industry supplies to its workers either because of statutory requirements or for other reasons. Almost without exception he has confined his industrial activity to case work remedial in nature. It is interesting to classify some of the reasons why the private physician has failed to participate in the fuller aspects of accident and disease prevention and the promotion of health programs among industrial workers, activities which have appealed to and been undertaken by so many extra-professional

agencies. The simplest explanation is that this attitude proceeds naturally from the way industrial medicine and surgery have developed. At the outset, interest was almost entirely concentrated on individual problems of surgical repair and rehabilitation. Likewise, medical education has, in the opinion of many commentators, not been at all helpful in developing a real appreciation of the effects of occupation on physical welfare and the best means for improvement. The greater emphasis on individualized study and management of the sick patient has prevented the assignment of attention to the principles of health conservation of groups and the recognition and arrest of incipient diseases which constitute to a very considerable extent the principal motivations behind the whole field of industrial health. There has also been intentional lack of coöperation on the part of many physicians arising out of their real concern that adequate standards of medical practice could not successfully be transferred into the industrial picture because of industry's unwillingness or inability to support them. Physicians have also had other unfortunate relationships with industrial medicine, characterized by lack of essential qualifications on the part of many who have undertaken this type of activity, its not infrequent status as exploited dispensary work under conditions where the "company doctor" attitude is too prominently interpreted as the proper function of an industrial medical service, and the methods used by some physicians to compete unfairly not only in industrial practice but in private practice through industrial connections. Another large contributor to dissatisfaction with certain features of industrial health has been discontent

*Read at the County Officers' Meeting, Saint Paul, Minnesota, February 24, 1940.

with certain characteristics of workmen's compensation administration, largely centering in absence of qualified medical representation in compensation administration, the illogical limitations both as to time and cost which have been set up in relation to medical and hospital care for industrial disability and in respect to free choice of physician.

Need for Medical Interest in Industrial Health

In spite of these unsatisfactory experiences, organized medicine has good reason to believe that industrial health is an important and rapidly expanding province of special medical interest, both in respect to preventive medical practice and public health administration. This opinion is based on the following considerations: There are approximately fifty million gainfully employed workers in the United States, ten years of age or over, who engage in some nine hundred occupations potentially hazardous to health. A great many, but by no means all, of these hazards are concentrated in manufacturing plants and in those enterprises devoted to the production and transportation of raw materials for the fabrication of manufactured goods. Conditions of employment have demonstrable effects on the productive and life spans of workers which, as has been shown, are most noticeable in unskilled occupational or socio-economic classifications. A great many, but not all, of the uncontrolled industrial health exposures exist in small plants which comprise a considerable majority of the industrial establishments in this country and in which the majority of workers are employed. Most of these small business enterprises are, or consider themselves to be, unable individually to support health programs beyond first aid and physicians on call who treat emergencies and compensable disability. In large plants industrial medical services are of demonstrated value in the reduction of compensation costs, the lowering of absenteeism, the lessening of labor turnover, and elevating the physical welfare of employees. On the average, each male employee can expect to lose approximately nine days of work annually, one day of which is due to accident, and a fraction of a day to occupational disease. The balance of lost time arises from illness not directly assignable to industry. The total cost annually of sickness and injury from all causes in industry is staggering and must be computed in the billions of dollars. Nonoccu-

pational health problems affecting as they do the regularity and continuity of working periods, together with the countless subnormal and pathological conditions uncovered through physical examination programs in industry, provide the private physician with an extensive opportunity to assist in the improvement of the physical welfare of employed groups.

Increased Demands on the Profession by Industry

There are two assumptions which can be drawn from this brief recital of the extent and nature of industrial health problems. The first is that demands made on all branches of the medical profession are much more likely to increase than otherwise. The other is that the time has come when the organized medical profession must manifest a constructive interest in the problems of industrial health, must realize their fundamental importance, and must actually do something about it or else relinquish leadership to industry. There are other even less attractive possibilities. This frame of mind is strengthened by the attitude of manufacturers' organizations, trade unions, insurance carriers, compensation agencies, and of the worker himself, all of whom are currently and actively engaged in establishing the economic, social and humanitarian values of control over industrial accidents and disease. If no other stimulus were provided, the extension of workmen's compensation benefits to occupational disease would be reason enough for the present widespread interest. But in addition, technical developments in industry give rise to health hazards multiplying so rapidly as to leave distinct gaps between recognition of the causative agency and the perfection of medical and engineering methods designed to cope with them. Progress will occur only as this lag is overcome by articulating available knowledge regarding occupational health exposures with the practicing medical profession, the industrial plant physician, and with the existing or developing agencies of industrial hygiene in state and local governments.

The Responsibility of Medical Organization

The Council on Industrial Health of the American Medical Association, therefore, believes that medical organization has a distinct obligation to safeguard the standards of medical service in industry both as to scope and to ade-

quacy. To accomplish these purposes it has implicit faith in medical self-discipline and education. We have as a consequence asked for and received in a little more than a year's time, co-operation from most of the medical associations in states where the concentration of industrial activity justifies the formation of coöperative committees on industrial health. A program has been suggested to these committees in the following terms which obviously must be adjusted to fit local circumstances:

1. To develop on the part of all physicians a good understanding of the proper functions of medical organizations in industry. These over and above required medical and surgical care are physical examination, maintenance of suitable records, the adoption and supervision of necessary control measures and the education of the employee to a personal interest in his own physical welfare.

2. To train physicians to recognize and report occupational diseases promptly.

3. To train industry and labor to the value of industrial health conservation.

4. To elevate medical standards under workmen's compensation.

5. To scrutinize all social legislation affecting the health of industrial workers.

6. To clarify relationships between industrial and private practitioners.

7. To improve relationships between physicians and insurance carriers.

8. To establish working relationships with all state agencies interested in industrial health.

9. To extend as far as possible activities of this same description into county medical societies.

It has been a source of very considerable encouragement to observe that already certain of the county medical societies are beginning to organize committees on industrial health, in order to provide for proper leadership in their own communities respecting health measures designed for employed groups and in accordance with local needs. Some thirty such committees have already been formed. These developments are of fundamental importance since it must be conceded that it is in the county society where the acute problems of industrial practice are encountered and where they are most directly dealt with. Interesting contributions in the field of

industrial health have already been made by county societies, as for example, the outline of "Duties of a Contract Physician," by the Wayne County Medical Society, Michigan, the plan for the control of extravagant medical testimony developed in the Fulton County Medical Society, Georgia; and the emphasis placed upon the essentially public health function of the plant physician as formulated in certain counties in Michigan where such physicians are deputized as health officers.

Activities adopted by or suggested for committees on industrial health in county medical societies have been presented to the state committees. It is not expected that any county medical society will be in a position to launch a complete program as outlined. The recommendations are offered in some detail in order to present the proper appreciation of the scope of industrial health activity and to suggest one or more projects which the county associations might profitably engage in.

Certain of these activities fall in the field of investigation.

1. A county society committee should have clearly in mind all past actions of the society which refer in any way to industrial medical practice or health maintenance of employed groups.

2. It should establish an index or file of physicians specializing in or giving major attention to industrial practice together with their industrial connections and the scope of service they provide. Recent experiences of the Council indicate that such undertakings are not too difficult if attempted on a county basis and that the knowledge obtained may be extremely useful in defining proper industrial medical objectives.

3. It should establish as much familiarity as possible with the character of industrial operations in the county and the essential industrial health problems of each, whether primarily caused by accidents, by occupational diseases or non-industrial connected illnesses. Without some attention to the collection of such information, a clear idea of the extent of the industrial health problem in any community will be obtained with difficulty. Once the nature of the business is known, many publications will be helpful in determining potential occupational hazards.

4. The committee should survey the relation-

ships existing between the physician in industry and (1) employer; (2) employee; (3) private practitioners. It is hoped that shortly the Council may provide a statement on the essentials of industrial medical service which will serve as a common ground of agreement for all parties concerned.

5. It should direct a great deal of attention to the needs of the small plant and how the private practitioner can, under county society guidance, bring to such establishments the advantages of health maintenance through physical examinations, plant sanitation, control of hazardous materials and processes, and health education of workers. This is on all counts the greatest contribution the medical profession can make in the field of preventive medical practice. Certainly the field is almost unexplored and offers a sufficiently large number of individual health problems to keep a great number of physicians busy for years to come. To assist the medical profession in the development of such services, the Council has projected a series of articles on medical organization in industry.

Other activities fall under the heading of correlation.

1. The committee can list the other community organizations which have or ought to develop an interest in industrial health problems.

Contacts should be established with—

Local health departments.

Industrial and public health nursing organizations.

Safety and industrial engineers or organizations.

Local hospital council.

Social and welfare agencies, as for example, health associations, tuberculosis clinics, venereal disease control committees, etc.

Associations of Commerce or local manufacturers' associations.

Local labor council.

Casualty insurance adjustors and brokers.

Local bar association.

Adjudicating agencies—courts, compensation commissioners or medical representatives thereof, and arbitrators.

2. The committee should determine whether any of these agencies are in a position to con-

tribute to the physical betterment of the workers along lines which private practitioners might have difficulty in providing or which small plant owners might have difficulty in financing individually.

Most important is education. In respect to professional training, it has been suggested that county societies can:

1. Use their influence to improve undergraduate training in fundamentals of industrial health.

2. Attempt to develop an educational service through meetings of the county medical society based on knowledge gained of local occupational exposures.

3. Attempt to acquaint physicians with true relations between trauma and disease.

4. Educate the profession to the best available means for the early recognition of intoxications or other occupational diseases.

5. Inform the profession of the statutes requiring the reporting of occupational diseases and strongly urge full compliance.

6. Request the inclusion of industrial health training in postgraduate courses under state society sponsorship.

7. Investigate the desirability of a section on industrial health in the scientific assembly of the state medical association.

There will be excellent opportunities for non-professional education, such as

1. Assisting the industrial nurse to improve her status ethically and professionally.

2. Demonstrating to plant operators the value, both humanitarian and financial, of employee health maintenance.

3. Investigating the possibilities for bringing to the worker himself a sense of personal interest in his own physical welfare both inside and outside the working environment.

4. Acquainting the general public with accomplishments in industrial medical practice and the intention of the medical profession to elevate standards in this field.

I hope I have succeeded in impressing upon you the fact that much needs to be done by medical organization in the field of industrial health. I hope also that we can count on your sustained interest and coöperation.

THE DEFENSE OF INSANITY IN CRIMINAL CASES*

JAMES A. GARRITY

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Moorhead, Minnesota

IN THE interest of public safety, your Association is to be commended for including in your deliberations, the question of the defense of insanity in criminal cases. You are a learned profession. You have the interest of humanity at heart. You see life from the beginning to the end, and you are so interwoven in the everyday affairs of man's life and the public good, that your findings and conclusions on the subject on which I have been called upon to address you, should be such as to receive an intelligent and responsive hearing.

Occasionally a criminal case in which the defense of insanity is raised, enters the courts of this state. It is a case in which the State is represented by the prosecutor. The defendant is represented by a member of the legal profession. In the course of the trial, members of your profession become important and convincing witnesses on both sides of the case. You are called upon to testify on behalf of the State, as well as on behalf of the defense. A lay jury must then weigh your expert testimony and return a verdict. When that verdict is returned and linked with events that follow, the public becomes aroused, ready as it always is to try to place blame on either the medical or the legal fraternity, or both, forgetting that in the long run it is the public represented by the jury that passes its final judgment, and must take the responsibility. I approach this subject not in a critical mood, or with any particular case in mind, but for the purposes of painting as it were, a picture of the facts and circumstances surrounding the subject, and then leaving it for such discussion as you find it deserves.

The County Attorneys' Association of the State, of which I am a past president, at its meeting held at St. Paul, in December, 1939, recommended the appointment of a committee for the purpose of preparing legislation affecting this subject to submit to the coming session of the legislature. Because of the fact that the insane person is suffering from a mental disease, it is my opinion that a committee from your

body ought to be appointed to work in conjunction with the committee from the County Attorneys' Association, and to jointly prepare laws and recommendations, to the end that they be incorporated in our statutes, with the hope that they will discourage the defense of insanity in those cases in which insanity does not in fact exist.

In entering upon the subject, I do not know of better words to express your feeling and mine, than the words of Judge Stone of our Supreme Court, in the case of *State ex rel. Sundberg vs. District Court of Hennepin county*, when he said:

"The natural solicitude of any judge for the public safety in these matters is to be commended rather than disapproved. There have been cases where innocent human life has been the penalty for the mistaken release of a person acquitted of crime on the ground of insanity and thereupon committed to a sanitarium. The medical profession, particularly those of its members who have made the study of mental disease a specialty—and outstanding among the latter should be the superintendents of our public hospitals for the care of the insane—are as alive to the danger as we of the legal profession. Whatever our own opinions may be, two compelling facts remain: (1) The patient after he is restored to sanity has a right to liberty, which not even the state can lawfully deny. (2) It is competent for the Legislature to say that the certificate of the superintendent of the institution where he has been under treatment shall be sufficient evidence of the fact entitling him to liberty."

Prior to 1931, a person acquitted of crime on the grounds of insanity and committed to a State Hospital or Asylum for safe keeping and treatment, could not be released except upon order of the Court committing and the written certificate of the Superintendent of the Hospital where he was confined, that the person had recovered and that no one would be endangered by his discharge. Chapter 364 of the Laws of 1931, changed the prior law and provided that upon the certificate of the Superintendent of the Hospital that the person had recovered and that no one would be endangered by his discharge, that then and in that event the person must be released. It did away with the provision of the

*Read before the County Officers' Meeting, Saint Paul, Minnesota, February 24, 1940.

right of the District Court to release. It made it mandatory upon the committing judge to release upon the presentation of the certificate from the Superintendent of the Hospital. In the Sundberg case, a District Judge refused to release the patient on the certificate of the Superintendent, because the Court felt that in justice to society and the protection of the public, that the Court was not at that time satisfied that the patient could be released with safety. In the Sundberg case the Supreme Court held that it was mandatory upon the District Court, under the terms of the 1931 law, to release the patient. You can see that three interests were in conflict. The medical profession stated it to be a fact that the person was cured, the legal profession, as represented by the District Court, felt that the patient could not be released with safety to the public, and third, the laybody of the legislature said: "Yes, we will disregard both the medical and the legal profession, and return the person to society." Here again we have an illustration of the fact that the blame should not be placed at the door of the medical or legal profession, but in the hands of the great majority of the laypeople, who make up the Commonwealth.

It is well settled that a person cannot be legally punished for any act committed by him while insane, although such act would be criminal if done by a sane person. Since a criminal intent is an essential element of crime, if by reason of insanity a person is incapable of forming any intent, he cannot be regarded by the law as guilty. No one, of course, wants to punish an insane person who is really insane. That person is a ward of the State. He should undergo confinement in the interest of public safety, and given such treatment as is necessary for mental illness. On the other hand, people should be discouraged from the trumped up defense of insanity where no insanity exists, and it is to these manufactured defenses that your association and mine should direct its efforts. From my experience as a prosecutor, I have come to the conclusion that there is a mental twist in all persons committing felonies, and if they are encouraged in the belief that upon a defense of insanity, a jury will acquit them and in a few weeks after the acquittal, they can walk out of a State Institution and again return to society and take their places as normal individuals, then and in that event the orderly administration of justice, in the

protection of the public and the public's right, will be hampered and nullified, and those who commit serious crimes, who have sufficient funds, friends and influence, will go free at the expense of the indigent prisoner, who, perhaps, has more of a mental disease than his more fortunate brother in crime.

The legislature of the state of Minnesota makes the laws. Our statutes at the present time read as follows:

"* * * but he shall not be excused from criminal liability, except upon proof that at the time of committing the alleged criminal act, he was laboring under such a defect of reason, from one of said causes, as not to know the nature of his act, or that it was wrong."

In the first instance then, in order to discourage the defense of insanity, I feel that our statutes applying to criminal responsibility of insane persons, should be amended to read as follows:

"Every person is to be presumed sane, until the contrary is proven, and that to establish a defense on the ground of insanity, it must be clearly proved that at the time of the committing of the act, the person was laboring under such a defect of reason, from a disease of the mind, as not to know the nature or quality of the act he was doing; or if he did know it, that he did not know he was doing what was wrong."

I would go a step further and suggest that if the mental competency of the offender was occasioned by himself, with the intent of committing the offense while in that mental condition, then such mental disturbance shall not be a defense.

The legislature should make provision giving the right to District Judges, where insanity is alleged as a defense, to comment upon the weight and value of the evidence, and to caution the jury concerning the defense, and this should be especially true where the judge is convinced that the attempted defense is a built up one.

As you men know, the County Attorney, under the laws of the State of Minnesota, is required to appear for the patient at all insanity hearings. He is attorney for the patient, and is there at the hearing to protect the rights of the patient. From my experience in listening to testimony and the examination by medical men, I have come to the conclusion that the really insane person indicates the mental disease by acts, conversa-

tions, etc., for a considerable period of time, and that in a majority of cases, the disease creeps on and can be detected long before the commitment is issued. I have seen some real insane people in my life. I do not remember one that evidenced any intent to destroy another life, although they have considered taking their own lives, and some of them, after they are released from institutions, have taken this step. The point I am making is that the real insane person, from my experience, is not bent on destruction of others, but that the sane person who is accused of murder, seems to want the public to think that he is insane, because he has taken another life, even when that life is the source of his life. I know that lives are taken without any premeditation. I know that lives are taken in a fit of anger. I know that lives are taken through wilful negligence, but our statutes are such as to distinguish these different takings of human life, and to provide punishment for different circumstances in connection with the taking, and that is why we have the different degrees of murder and manslaughter, and within late years, the statute covering death by negligent operation of a motor vehicle.

Of course, with the development of the criminal law, defenses are developed. We do not want to deprive any man of a legitimate defense, but defense of insanity should be and must be safeguarded.

Our statutes provide that whenever a person is under an indictment or information, and before or during trial, and before a verdict is rendered, shall be found to be insane, etc., the Court shall forthwith commit him to the proper State Hospital or Asylum for safekeeping and treatment, and if he has homicidal tendencies, he shall be committed to the asylum for the dangerous insane. If, after the person has recovered, he is then to be returned and placed on trial under the indictment or information. Another provision of the statute provides that where a jury acquits a defendant on the grounds of insanity, and shall so state in its verdict, then the Court commits to the hospital or asylum, and the person is there kept until recovery, then to be released, if no person is endangered by the discharge. The first provision provides for the insanity hearing before or during trial, and the other provision covers the acquittal on the ground of insanity.

As the law now stands in Minnesota, a person can be acquitted of a crime today, confined in a State Asylum tomorrow, and released the next day. The Courts have nothing to do with the release under the law as it now stands, but your profession has. It is the certificate of one of the members of your profession who returns the defendant to society and who guarantees the public that he is no longer dangerous. What an important part your profession plays in the administration of criminal law. With the law in Minnesota as it is, your profession and mine cannot be blamed by the public for the eventual outcome of these particular cases. It is interesting to know how other lands and other states determine the punishment in cases of this nature. In England, the confinement is to be until his Majesty's pleasure is known, and in Canada, until the pleasure of the Lieutenant Governor is known. In the United States, some states provide that a person acquitted of murder on the ground of insanity, is to be committed to prison until the further order of the Court. Other states provide that the confinement is to be until the prisoner is discharged by the Governor, or by act of the legislature. In another state, a person acquitted of murder or manslaughter, by reason of insanity, is to be committed for and during the term of his natural life, with a provision that he may be discharged by the Governor, by and with the advice and counsel of the hospital and prison authorities.

The state of Michigan, during the regular session of 1939, passed an Act known as Senate Bill No. 93. This Act provides that whenever any person charged with murder, under the laws of the state, and who has been bound over to the court having jurisdiction over such case, the clerk shall immediately notify the State Hospital Commission and such Hospital Commission shall as soon as possible, cause the person to be examined to determine his mental condition and the existence of any mental disease or defect, which would affect his criminal responsibility. The Commission shall designate three psychiatrists for the purpose of making such examination. The report of such psychiatrists then is filed with the Clerk of Court, and becomes accessible to the court, the probation officer, the prosecuting attorney and the attorney for the defendant. The Act provides that after a person is acquitted of the crime of murder by

reason of insanity, he shall be forthwith committed to the State Hospital for the criminally insane for the remainder of his natural life. The Governor may, however, discharge such person upon recommendation of the State Hospital Commission based upon investigation by it.

The new Swiss Criminal Code of December 21, 1937, provides as follows:

"Sec. 2. *Responsibility*. ART. 10. LACK OF RESPONSIBILITY. Whoever because of insanity, idiocy, or grave disturbance of mental competency at the time of commitment of the offense shall be incapable of recognizing the illegality of his act, or whoever by these reasons shall be incapable of acting in accordance with his insight into the legality of his act, shall not be punished.

"ART. 11. PARTIAL RESPONSIBILITY. If the offender, at the time of his act, was mentally disturbed or his mental competency diminished or if he was mentally retarded to the extent that his capacity to recognize the illegality of his act or his capacity to act in accordance with this insight was diminished, the court, in its discretion, may impose a less severe penalty (Art. 66).

"ART. 12. EXCEPTION. The provisions of Art. 10 and 11 shall not be applicable if the serious disturbance or retardation of the mental competency of the offender was occasioned by himself with the intent of committing the offense while in that mental condition.

"ART. 13. MENTAL EXAMINATION. The prosecutor or the court, when in doubt as to the responsibility of the accused, shall order a mental examination of him by one or more experts. A mental examination shall be ordered if the accused is a deaf-mute or if it is alleged that he is an epileptic. The experts shall state the condition of the accused and also give their opinion whether he requires care in a mental hospital and whether his condition is dangerous to public security and order.

"ART. 14. DETENTION OF INCOMPETENTS, ETC. If the incompetent or partially responsible offender is considered so dangerous to public security and order as to necessitate his confinement in a mental hospital, the court shall order his detention. The court shall suspend the execution of the sentence against a convicted person who is partially responsible.

"ART. 15. CARE OF INCOMPETENTS. If the condition of the incompetent or partially responsible offender requires his treatment and care in a mental hospital, the court shall order that treatment and care. The court shall suspend the execution of the sentence against the convicted person who is partially responsible."

After carefully studying the different laws of foreign countries and of the different states of the union, I am proposing that a law be so framed for adoption by the legislature, providing that when any person who is tried for a felony and is acquitted by reason of insanity, that that per-

son shall be committed by the court to a State Hospital, and if the crime is murder or manslaughter, to the State Hospital for the criminal insane, until the further order of the court. I would have the law carry a provision asking the jury to say in their verdict, whether or not in their opinion the defendant had insane delusions, irresistible impulses, emotional insanity, or was generally insane. If the court can comment on the defense of insanity, the jury would have no trouble in making these special findings.

I then would provide that a commission be established consisting of the superintendents of the state hospitals. After the commitment, this commission would review the case of the defendant, and they would certify it back to the committing judge. If their certificate showed that the defendant was cured, then the Court would impose such sentence as deems commensurate with the circumstances surrounding the crime. The situation would then be that there would be punishment imposed if the insanity passes, and if the person is really insane, he, of course, would be continually confined to the State Hospital. The defendant should not object. If he was found guilty and sentenced to a penal institution and then became insane, he, under our law, would be removed from the institution to a state hospital, and sent back again after he regained his mental poise. If the defendant is sent to a state hospital before he is confined, he should pay some penalty for his act, and this should be the intent of the law.

I believe that we should also define a psychiatrist. If the testimony of these medical men is to be taken in criminal trials, they ought to qualify. I would suggest that you ought to consider a law saying that before a physician can qualify as a psychiatrist, for the purposes of giving testimony in a criminal case, that he should have at least five years of practice confined wholly or substantially to the diagnosis, care or treatment of persons suffering from nervous and mental disease, or mental defect. This would apply both to the State and to the defense, and if the law is passed by the legislature, the jury and the court would have the benefit of the testimony of really qualified men.

It is considered unethical for a prosecutor to appear as a defense attorney in the matter of criminal prosecutions in his own state. In my opinion it would appear to me to be unethical

for a medical practitioner, who is employed by the State, to give testimony as a qualified expert for the defense, especially when that doctor occupies the position where he might be called upon to pass on the sanity of the person involved in the action in which he testified. I believe that your association would not oppose the introduction and passage of a law prohibiting such an employee of the State to appear as a defense witness in criminal cases.

There is a presumption in law that insanity continues until the contrary is shown. As the law now stands, the beneficiaries thereof are not convicted criminals, but wards of the State, undergoing treatment in the interest of public

safety. As the law stands, the question of recovery is one for members of your profession and not mine. The release of an insane patient is a legislative act, and is controlled by the statutes of the State.

Our laws ought to be safeguarded and can be safeguarded by the united action of your association in conjunction with the prosecutors of the State, and the general public. It is my hope that by joint action, we will be able to convince the legislature of the righteousness of our stand, and if that body will follow our recommendations, the State of Minnesota will assume an outstanding position in the realm of jurisdiction in discouraging the defense of insanity in criminal cases, in an unjust cause.

EXTENSION OF GROUP HOSPITAL SERVICE*

ARTHUR M. CALVIN

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GROUP hospitalization, as we all know, has played an important part in the plan for providing health at a low cost. Group hospitalization plans, which started with the simple idea of group budgeting to solve the problem of unexpected hospitalization, like all new, untried plans, have had their difficulties. Pioneering in any new field is no easy task.

Because of the necessity for sound development, these plans, so successful in urban centers where large employed groups were easily contacted, have been slow to spread throughout the country into the smaller towns and sparsely settled areas where group contacts are difficult.

A few years ago the feasibility of these plans was questioned. Today there is no longer a question of feasibility. Non-profit group hospitalization plans have proved successful—so successful that farmers and residents of small towns are asking for the same worry-free protection for themselves and their families that the city dwellers enjoy.

Hospitals, too, have expressed their desire for this service. They realize that an increase in patients or bed occupancy will mean lower oper-

ating costs, and that hospital administrators will have fewer credit and collection problems. The public is demanding that hospitals provide such a plan.

Medical men, too, more and more, are realizing the value of hospitalization plans not only for their patients but for themselves. Now, a doctor can urge a patient needing hospital care to have it, knowing that the patient's recovery will not be retarded by worry over a big bill, knowing too, that when the hospital bill is paid by the non-profit hospital service association, the doctor receives his fee sooner.

Employers favor the idea because they are no longer asked for loans or "cash advances" to cover unexpected hospitalization. The community, as a whole, which is relieved in large measure of the burden of charity hospital care for the low-income group, should sponsor the plan.

Statewide Plans

Answering these multiple requests for service, several of the approved non-profit hospital service plans are engaging, at the present time, in statewide development. Among these are: The Hospital Service Corporation of Alabama; The

*Read before the County Officers' Meeting, Saint Paul, Minnesota, February 24, 1940.

Plan for Hospital Care of New Haven, Connecticut; the province of New Manitoba Hospital Service Association with headquarters in Winnipeg, Manitoba; the recently established Colorado Hospital Service Association; Group Hospital Service, Inc. of Wilmington, Delaware; Group Hospitalization, Inc. of Washington, D. C.; the Associated Hospital Service of Maine; The Associated Hospital Service of Baltimore, Maryland; the Associated Hospital Service of Massachusetts; Michigan Society for Group Hospitalization; Group Hospital Service, Inc., of St. Louis and Kansas City, Missouri; Hospital Service Plan of New Jersey, headquartered in Newark; Hospital Service Association of North Carolina at Chapel Hill and the Minnesota Hospital Service Association. The Hospital Service Associations of Rhode Island, Iowa, Texas and Wisconsin are also planning state-wide developments.

Brief Recapitulation

Before going into the state-wide picture in detail, I should like to sketch for you, briefly, the growth and accomplishment of some of the large non-profit plans. It is estimated that today, over five million people in the United States are actually entitled to benefits under approved, non-profit hospital service protection. New York leads the field with a total of 1,305,958 persons covered. Minnesota continues to retain second place with a total of approximately 310,000 persons covered. Cleveland ranks third and Philadelphia, under the guidance of Mr. van Steenwyk who did so much for the Minnesota Plan, is rapidly coming to the fore. Rochester, New York, has the highest percentage of participation.

Because we are primarily concerned with Minnesota, you will be interested in hearing how rapid the growth has been here in the past few years. In January of 1936, after operating two and one-half years, Minnesota had 12,037 subscribers, 12,000 dependents; a total of 24,037 persons protected. In January, 1939, a year ago, a total of 245,112 persons. At the end of December of the same year, 309,216. During the six years that the Minnesota Hospital Service Association has been in existence, 68,740 people have been hospitalized for a total of 482,610 hospital days, and a saving to subscribers of \$1,990,249.35. These, I think you will agree, are imposing figures.

Problems in Statewide Development

Minnesota, pioneering along with other states in state-wide development, has been delayed somewhat in her activities for a multitude of reasons. She has, in the first place, had the same general problems that confront other plans, among which are those of educating people in rural communities to make fuller use of their local hospitals. Hospital service, unlike rural electrification or telephone service, is an intangible commodity and intangibles are, of course, more difficult to sell.

Sponsoring of the plan in small communities is a most important question. The hospital itself, of course, should be the central point of interest and enthusiasm, but the plan should have more than hospital sponsoring. It should be endorsed by the medical society, the hospital trustees, civic organizations and persons interested in general in community welfare. These are all important factors which contribute to the successful development of the plan.

Another problem general to most plans is that of the proprietary hospital. Hospital service plans, as we all know, have been developed primarily for the altruistic purpose of helping people to help themselves in securing hospital care when they need it. The hospital service organizations have been reluctant to spread into communities where it might appear that the association was enticing patients away from some hospitals and favoring others. This problem of proprietary hospitals has been largely cleared up in several districts of our state by working in close conjunction with the medical societies throughout the state, and by the actions of the various hospitals themselves in making application for membership in the Association. Proprietary hospitals may join the association here in Minnesota by changing their corporate structure from profit-making to non-profit.

To simplify promotional activities here we have districted the State of Minnesota into Medical Counselor Districts corresponding to the State Medical Society districting. While this may not be an entirely satisfactory method, because all hospitals within a certain district do not apply for membership in the plan at the same time, it seems, at the present time, the most feasible one.

We have, now, nine Medical Counselor Districts and are starting work in those districts in which most hospitals have indicated their desire

to join the plan. As an illustration: Take one city in Minnesota, a city that has been ready and acceptable to the Hospital Service Association for some time. There were, in this area, a number of hospitals not acceptable as member hospitals of the Association because of the fact that they were privately owned and incorporated for profit. Recently we have had meetings in that area with the hospital administrators and medical men of those districts to discuss the problem of proceeding with rural enrollment. At these meetings it was suggested that proprietary hospitals desirous of joining the plan, should reincorporate as non-profit institutions. After such reorganization they were to conform to the regular requirements of all hospitals seeking admission to the plan by: (1) securing the approval of their Boards of Trustees and medical staffs to join the Association; (2) securing the approval of their component or county medical societies and, if possible, sponsorship of the plan by some local civic agency, such as the Chamber of Commerce, Rotary, Kiwanis or other civic body; (3) presenting their formal written application for membership. The last step, of course, is the approval by the Board of Trustees of the Minnesota Hospital Service Association. To aid hospital administrators in disseminating information about the plan, representatives from our Association have given talks before these various bodies.

After discussing various problems affecting our extension work, those present at the meetings agreed that if, by a certain date, all the hospitals that desired to become members of the Association had not met the requirements, the Hospital Service Association was to feel free to go ahead with promotional work in that area.

Foremost among our own particular problems here in Minnesota has been our lack of enabling legislation defining our scope and powers. We hope soon to have such enabling legislation and will appreciate your coöperation in this. Another problem was where first to start and how to proceed.

Proposed Program

The principal reason for the development of non-profit hospital service plans in the rural areas is exactly the same as that which first brought non-profit plans into existence, namely, the desire to make good hospital care available to

more people through a low-cost budget plan. People, in general, are utilizing hospitals to a much greater extent than they did a few years ago as a study of hospital occupancy figures reveals. But this increased utilization is primarily in metropolitan and government hospitals. Rural development, therefore, will be successful in direct proportion to the preliminary educational program.

Promotional Procedures

Once the hospitals in a district are approved for membership, our next step is to prepare the field so that we may contact subscribers. This preparation must be a coöperative venture between the hospital administrator and trustees, community leaders and the Hospital Service Association. This work cannot be done alone by the Hospital Service Association representatives. Meetings should be held with Civic organizations such as the Chamber of Commerce, Rotary, Kiwanis, Lions, etc., to acquaint the local business men with the plan. I cannot stress strongly enough the necessity for adequate newspaper publicity in the smaller communities. Newspapers are, in many instances, the only adequate means of disseminating information in sparsely settled areas and it has been adequately proven to us from the promotional work in the few communities that we have already developed that the most successful results were obtained in the communities where we had most newspaper publicity. In areas where newspaper publicity was difficult to obtain, we have stimulated enthusiasm by the wearing of "Blue Cross" buttons similar to those of the Red Cross. We have urged doctors and community leaders to wear these pins and their coöperation has helped tremendously. Chart talks and our educational film, "When Pennies and Seconds Count" have also stimulated enthusiasm.

I should like to say here for the benefit of those who have been eager for advance publicity about the hospital service plan that we have found it unwise to have a great deal of newspaper publicity until immediately before we are ready to start promotional activities. Publicity too much in advance of our actual entry into the field gives commercial insurance companies an opportunity to capitalize on our efforts.

Once we have entered a community our promotional activities are more or less similar to

those in metropolitan areas. Our representatives contact the heads of business firms to ask for company time to explain the plan, and payroll deductions to facilitate collections. The plan is explained through a chart presentation showing what benefits are derived, the costs to the subscriber, etc. To facilitate the work of the representatives and save time and promotional expense, it is advisable, wherever possible, to have people in small groups in similar industrial endeavors to join the Association in one large single unit. Let me explain this in detail:

In Stillwater, Minnesota, where we have had a most successful development, the Stillwater Association (which corresponds to our Chamber of Commerce), offered to act as group leader for people in small firms, that is, firms where only one or two were employed. The Hospital Service Association sent mimeographed letters to those eligible for this group and held two community meetings. When 40 per cent of the group was secured, subscription payments were made to the Stillwater Association on a quarterly basis. Similarly, instead of taking each small grocery and butcher shop as an individual unit, the Stillwater Grocers' and Butchers' Association volunteered to act as group leader for that organization. Store managers attended an explanatory meeting in a body, took literature and application cards to their individual stores, explained the plan and returned the signed application cards together with quarterly payments to the Butchers' and Grocers' Association secretary and so that group was successfully organized. The city employes of Stillwater joined in a body on a payroll deduction basis. School employes and teachers similarly joined in one unit. All such systems for simplifying our promotional and collection procedures are, naturally, most acceptable to the Association. Similar promotional activities will be encouraged throughout the State.

How About the Farmers?

One of the first questions asked us about state-wide development is "how are we going to enroll the farmers?" Enrollment of farmers does present a problem in that they are scattered over a large area and it is frequently difficult to contact them in group meetings. We do find, however, that farmers can be successfully enrolled through banks, coöperatives, creameries, Farm Bureaus or like organizations. We have already developed

a most satisfactory Farm Bureau Group in Hennepin County, and County Agents, for the most part, throughout the State, are not only helpful but eager to bring this protection to their farm patrons.

The Hennepin County Farm Bureau group was completed after several meetings between our representatives and influential farmers in the Farm Bureau. The farmers themselves were largely instrumental in securing applications after they were thoroughly informed about the plan. Payments are made on a quarterly basis to centrally located farmers who remit to the Secretaries of the Farm Bureau units who in turn remit to the Hospital Service Association. The Hospital Service Association bills only the Farm Bureau Unit Secretary and the Farm Bureau takes care of all further billing and collection. A primary requirement, of course, for Farm Bureau participation, is membership in the Farm Bureau itself.

An ideal enrollment of farmers so far as the Hospital Service Association itself is concerned, would be through creameries where a deduction from cream checks might be possible. However, the Farm Bureau County Agents have been so coöperative and so interested in this development that those groups organized have been very successful.

In Stillwater, we accepted farm groups through the banks. When a certain percentage of the farm patrons of the bank had signed application cards, protection became effective for the bank's farmer patrons.

The State of Missouri has had a most interesting experience in the enrollment of farmers. They started their initial move for farm service some two years ago. Informal discussions of the plan with officials of the Missouri State Farm Bureau led to its adoption as an integral part of the Bureau's service program to farmers.

Realizing the importance of a preliminary educational program at the very outset, the Missouri Hospital Service Association started a program of publicity through the Farm Bureau's weekly newspaper with informative articles published about the hospitalization plan for a period of some eight months. At the same time, hospital service was a principal topic at all county bureau meetings. In Missouri, arrangements were made with the State Farm Bureau to accept membership dues quarterly and to remit one

check for the whole state to Group Hospital Service. Because farm income is seasonal, arrangements must be made consistent with the ability of farmers to pay conveniently. Missouri insisted that every county group be personally addressed by representatives of the hospitalization association before applications were accepted.

Commercial Insurance Companies

We believe heartily in insurance principles, but we are convinced that profit-making corporations cannot begin to give so much for the money as non-profit.

We must stress here the difference between the "service contract" which the non-profit hospital service plans provide and a "cash indemnity" policy which insurance companies offer. Under the "service contract," the hospital is paid directly for services rendered the subscriber or his family. Under a "cash indemnity" policy, all too often the subscriber receives the check and forgets his obligation to his hospital and doctor.

The "Blue Cross" card of our hospital service association not only eliminates the need for a down payment on admission to a hospital but also eliminates the filling out of claim blanks and the correspondence necessary to effect a reimbursement from an insurance company. This is an important difference to the subscriber and a much more important difference to the hospital as it assures the hospital its payment. Yes, you may say, "But why not take an assignment of the insurance claim?" Many of our Twin City hospitals have learned that this does not mean a secured payment as the insurance contract may have excepted that particular hospitalization under some limitation in its policy. When this occurs, the patient always feels that he has done his best and that his obligation is ended.

Payment to the Hospitals

There is another problem which associations have had to face in extending benefits on a state-wide basis, that is, the payment to hospitals outside of the metropolitan area. In Minnesota we have established a per diem rate of payment to hospitals. This applies to hospitals both in metropolitan and country areas and should, we believe, prove satisfactory.

Serving the Rural Area

We have been asked frequently, too, whether we will establish offices throughout the state. As yet, we do not believe such a plan is feasible as we are endeavoring to keep the costs as low as possible. Our plan, at the present time, is to have a district representative servicing that area when that district is sufficiently developed. It may be entirely possible, however, if the plan grows large enough, to have local representatives in addition to district directors.

Hospital Responsibility

The soundness of the hospital service plan in any community is entirely dependent upon that community itself—the participation and coöperation of the medical profession, the hospital trustees and administrators. I recall, that prior to the Service Association's organization in St. Paul there were many discussions between the hospital superintendents, Mr. van Steenwyk and a few members of the medical profession. The relationship in this small group was most cooperative.

We started with the premise that the plan answered a mutual need of the patient, the doctor and the hospital. It was, to us, more than just a way of filling empty hospital beds. It was an opportunity to provide the means by which patients could secure necessary hospital care and thereby use all of the equipment and skill provided by the hospital. This same understanding must be assumed by the hospital administrators, trustees and the medical profession of the rural hospitals throughout the state.

In many states a definite responsibility is entrusted the communities themselves by asking them to assume the actual promotional costs of the plan. For example, the Alton, Illinois, plan is preparing to serve a town of 16,000 and the doctors, civic leaders and hospitals advanced \$2,000 for promotional expense with the understanding that some may be repaid. Here in Minnesota we ask no such stringent guarantee of responsibility. We do ask each member hospital to pay a small membership fee, dependent upon the size of the hospital, as evidence of good faith. The promotional and operating expense in connection with developing neighborhoods is borne by our central office. Here, too, all mechanical procedures are carried out. Oper-

ating expense is charged back on our books to the new community as it develops.

In Massachusetts, an interesting experiment in state-wide development was conducted. I would like to quote from a letter we have recently received from the director of the Massachusetts plan. Speaking of enrollment on Nantucket Island, he says, "We have enrolled nearly half of the Island, primarily through the efforts of a trustee of the Nantucket Hospital. The local bank acts as the Remitting Agent and we permit our Ward Plan to be available to them. . . . In a community of this size, Mrs. Laprade, the hospital trustee, being a registered nurse, knows all about every resident and does not accept any applications from people she regards as poor risks. As a result, our experience is especially good. It is a rare day that we even question a case from this group. The doctors are most coöperative and if we could duplicate this situation through the various summer communities of Massachusetts we should be extremely happy. There has been little or no acquisition cost. Only once has a member of our Enrollment Staff visited the island and this was to enroll the people under the only two payrolls having ten or more employees. We accept additions to the group quarterly and even oftener because we have explicit faith in the way the job has been done."

East and Middle West Plans

Mention of the Ward plan in the letter above, brings up a new feature as far as we in Minnesota are concerned. Hospital operations in the East, as compared to ours in the Middle West, are somewhat dissimilar as far as hospital economics are concerned. This is due largely to the variation in economic groups. The low income groups in the East have the privilege of utilizing the free wards of hospitals without cost or payment of medical fees. As soon as these people pay for their own hospital care they immediately assume their own doctor bill. This fact, and the factor of large numbers of part-time and unemployed people entail great responsibility for the hospitals in providing free care. Consequently, the wealthy people of the East contribute largely to the endowments of hospitals in that area for such free-ward care.

In the Middle West, those of low income selecting the voluntary hospitals for their care

have been accustomed to pay for ward beds and for medical care. There are no free-wards in the Middle West hospitals. Patients requiring free care may be placed in most any type of accommodations and free medical care is determined by the attending doctor himself. And, then again, of course, we have the tax-supported hospitals which care for many of the low income groups with little or no charge.

The rate structures in the East, in many voluntary non-profit plans, range from \$1.50 to \$2.00 a month for families. We feel these rates are too high for participation of the low-income group in Minnesota. In the Middle West our rates are so much more inexpensive that those in low-income groups who prefer independence to charity can readily make use of the plan. We believe that ours is a rate that farmers, too, will not find exorbitant.

In speaking of state-wide development, we usually consider it from the dual viewpoint of "suburban areas" and "rural areas." Actually promotional work and servicing suburban areas is very similar to that of metropolitan centers. The promotional and servicing of rural areas, because of the wide area covered, presents a somewhat different picture. Despite this, however, a voluntary service plan can effectuate as beneficial a service for those in sparsely settled districts as in the more compact areas.

Forty-five hospitals in the Twin Cities, Duluth, Fergus Falls, Stillwater, St. Cloud, Bemidji, Breckenridge, Moorhead, Perham, Little Falls, Red Wing, Faribault, Bertha, Thief River Falls, Winona, New Prague, Hutchinson, Cloquet, Detroit Lakes, Alexandria, Wadena and Crookston are now members of the Minnesota Hospital Service Association. Several others have fulfilled requirements and have been approved for membership and we shall be in those areas very soon.

We feel that the approved hospital service plans throughout the United States are achieving their altruistic aim of better health care for a majority of people. We know that our hospitals and our doctors who are so rich in their heritage of humanitarian service will give still further of that service in coöperating with these plans.

We know, that in addition to helping the doctor with a few of his problems and the hospital with some of its problems, we are helping to relieve the community of part of its burden of

charity care. The wisdom of providing a low-cost plan here in the Middle West is realized when we find that two of our largest tax-supported institutions in the Twin Cities have noted

a decidedly lower occupancy in their hospitals since our plan's inception. Thus our plan is doing what we wanted it to do—help others to help themselves.

A SURVEY OF HEALTH ACTIVITIES AND PROBLEMS AMONG FORMER UNIVERSITY STUDENTS

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FOR several years the General College has been gathering information about the activi-

For several years the General College has been gathering information about the activities, problems, and attitudes characteristic of young adults who formerly had attended various colleges of the University of Minnesota. Approximately 1,400 questionnaires, 52 pages long, were mailed to a cross-section of men and women who had entered the University in 1924-25 and 1928-29. The replies, received from 951 of these former students, constitute the raw material from which the data reported in this article are drawn.

Broadly speaking, the purpose of the investigation was to gather information which would be helpful in planning a more appropriate curriculum in general education—a curriculum which would be adapted not only to the abilities, needs, and interests of students, but which would maintain, also, a realistic awareness of the kinds of activities and problems likely to characterize the students as young adults in their vocational, home and family, personal, and socio-civic relationships. Among the areas of adult living sampled in the questionnaire was that of health. The present article summarizes the health activities, problems, attitudes, and costs reported by these former University students.

Before reporting specific information concerning health, it is necessary to describe these adults briefly in terms of their educational, occupational, economic, and cultural status, so that the data with respect to their health practices may be viewed from a proper perspective. Educationally, a little more than half of these young adults graduated from the University; and about one-third of them spent only two years or less at the University. When the survey was made the group

ranged in age from twenty-three to forty-eight, with the median around thirty. About 70 per cent of them live in Minnesota. Among the older group (those who entered the University in 1924-25) three-fourths are married; and among the younger group (those who entered the University in 1928-29) half are married. Their jobs, for the most part, are good ones. A third of the men are in the professions. A fourth are in semi-professional and managerial jobs, such as accounting, banking, and manufacturing. Another fourth are in skilled trades, clerical work, or retail business—jobs such as retail dealers, bookkeepers, insurance agents. And the remaining small group (about 15 per cent) are found in semi-skilled jobs, minor clerical work, or minor business occupations. These jobs, apparently, provide them with a relatively high standard of living—the median income of the older group being \$2,400 and of the younger \$1,800 per year. In the total group, men and women combined, one-fourth have incomes above \$2,700 and one-fourth have incomes below \$1,300 a year. In comparison with the status of families in general in Minnesota and the Northwest, it may be said that this group of former University students stands in the upper one-fourth in terms of educational, occupational, economic, and cultural advantages. With the general character of the group thus briefly described one may now consider their health practices from a proper frame of reference.

Attitudes and Opinions Related to Health

This group had very little health education at the University. Some of them had a two-credit course in hygiene. Yet some of their attitudes are surprisingly liberal. Ninety-four per cent of them

believe that postmortem examination of human bodies can be justified for medical research, only about 1 per cent disagreeing. The remainder are doubtful. Eighty-six per cent of the men and 84 per cent of the women believe that birth contraceptive information should be available to all, and less than 10 per cent disagree. About 20 per cent of those questioned were Catholics. Attitudes otherwise include the following:

	Per cent of Men Women	
Biology of human reproduction should be taught in high school.....	Agree	84 88
	Disagree	7 3
Insanity is a disgrace that shouldn't be talked about	Agree	4 1
	Disagree	79 90
Feeble-minded persons should be sterilized	Agree	85 88
	Disagree	5 4

Concerning sterilization and many other controversial issues, many pros and cons and practical considerations influence judgments. Nevertheless, the insider frequently must modify his efforts because of the opinions of those who have not so thoroughly investigated a question. These people were given ample opportunity to profess indecision.

	Per cent of Men Women	
Government should adopt stringent requirements for licensing auto drivers	Agree	91 95
	Disagree	3 2
People should know much more than they do about contagious diseases	Agree	96 95
	Disagree	2 3
It is desirable to keep strict quarantine for mumps and chickenpox.....	Agree	74 85
	Disagree	7 6
Expense often keeps people from going to a doctor when they feel they should	Agree	87 94
	Disagree	7 1

Needs in Education

These former students now wish they had received education on various health subjects. The following, in per cent of total persons tested, signify this need:

	Per cent of Men Women	
How to meet nutrition needs for myself and family on the money available	23	33
How to select a medical doctor	38	39
How to select a dentist	34	30
How to prevent colds (!)	64	62
How to care for colds	54	46
What vaccines and serums are effective for various diseases	45	49
The human anatomy.....	29	34
Human physiology	32	33
How to get information concerning heredity	27	36

What the scientific basis is for claims of chiropractors, electric healers, naturopaths, and other practitioners.....	44	35
How to give first aid.....	48	58
What reliable sources of health information are available	41	40
How the government protects against worthless patent medicines.....	29	35
What health standards regulate the milk supply	22	34

Slightly more than one-third of these persons are parents. Answers concerning education needs strongly reflect this fact. Non-parents do not seem interested in questions involving child care; parents are markedly curious.

	Per cent of Men Women	
How to meet emotional problems in children, such as fears, stubbornness, etc.	30	40
What disciplinary measures to use.....	29	38
What diets are desirable for young children	24	28
How to prevent friction, jealousy between children of a family.....	18	25
How to train children in physical habits..	21	23

Efforts Toward Health

Forty-nine per cent of the men and 53 per cent of the women had a complete physical examination during the year preceding. Among those who did not, the following reasons were cited:

	Per cent of Men Women	
Never got around to it.....	25	10
Felt it was unnecessary.....	58	57
Couldn't afford it	9	12

The remainder failed to state a reason. During the preceding year the medical adviser consulted was:

	Per cent of Men Women	
Physician	72	79
Surgeon	18	13
Eye, Ear, Nose, and Throat Specialist..	33	36
Dentist	82	90
Osteopath	5	6
Chiropractor	3	3
Christian Science Practitioner	4	35

About 50 per cent stated that they read regularly articles on health. About 6 per cent had investigated to determine what diseases occurred with more than usual regularity in their families. Other health practices reported were:

	Per cent of Men Women	
Included in budget provision for medical care	15	24
Paid an organization for group medical benefits	18	12
Paid an organization for hospital benefits	25	25

Cost of Medical Care

These people were questioned concerning their medical expenses. The figures obtained are

shown below. They are not set forth as representing actual outlay, but rather as representing what these people said they paid—and perhaps in some instances this may mean what they want others to think they paid. The investigators did not inquire into specific expense items, and no vouchers were shown. All through, this report is intended to show reactions toward health matters. It behooves the reader of survey results to keep this point of attitudes in mind, even if he challenges statements elicited.

Cost of medical, dental, and hospital care the preceding year was stated to be:

	Single	Married, but no children	Married with children	Total group
Median	\$26	\$40	\$100	\$46
Q ₃	61	103	187	119
Q ₁	12	15	38	17
Q	25	44	74	50

The number of persons included in the above estimates of medical costs for the total group are as follows:

1 person.....	37%
2 persons.....	30%
3 persons.....	19%
4 persons.....	10%
5 persons.....	4%

It would be of interest to check back thoroughly on these cases. One might thus find that people who undergo a heavy medical expense in one year continue to give that figure as their annual expense for years after.

When these people were asked whether they were ever in debt for medical care, 28 per cent replied in the affirmative, 70 per cent in the negative. Anent this point, 43 per cent of the men and 30 per cent of the women had bought goods on the installment plan, and about one-third remarked that it is hard to keep out of debt. About 25 per cent desired information on where free medical service could be obtained.

These apparently average ex-university students belonging to higher general economic levels appear to favor "socialized medicine." One question among many shows this tendency, and also shows the increasing tendency in younger people to believe thus. The question was stated rather peculiarly: "Private medical doctors should encourage trends to socialized medicine."

	Older group 1924-25	Younger group 1928-29
Agree	41%	45%
Disagree	29%	23%
Undecided	30%	32%

It should be noted that most of these people were not subjected in school days to vigorous presentation of either side of the issue.

Questions for Health Education

Many people object to surveys and some doctors will question the findings of this survey. It is presented simply as a widely published survey, prepared by educators in conjunction with Doctors Shepard and Dukelow. It represents a sincere attempt to get, as an ultimate objective, better health education. One general question posed is, "What need in health education is now felt by the post-college adult?"

Educators want to know what to teach about health and disease. How far shall we go in education concerning symptoms and treatment? What special methods does health education require? What perspective views shall be given? Students, prospective teachers, and instructors of prospective teachers seldom hear these questions discussed by those who have stood at the bedside or listened and examined at the office in the rôle of physician. Particularly in the teachers' colleges and other state colleges is the physician-teacher absent. But the reason does not, we think, lie in discrimination against the physician-teacher.

BIRTH RATE STATISTICS

According to a recent statement of the Census Bureau, there were 2,262,726 births in the country last year, a rate of 17.4 births per each 1,000 estimated population. In 1938 the rate was 17.6 and in 1937 it was 17. Low rates were reported for New Jersey—13, Connecticut—13.5, Massachusetts—13.6 and New York 14.4. Arizona had a rate of 26, Mississippi 25.6 and Utah 25.1, while New Mexico led with a rate of 33.7. The figure for Minnesota was 18.9, identical with that for 1938.

EYE DEFECTS CAUSING LOSS OF VISION

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THE trend of modern medicine has a distinct leaning toward conservation; this is especially so in the field of ophthalmology. Conservation as applied to the eye embraces all efforts to obtain and retain whatever degree of sight is possessed in the normal eyes as well as defective eyes. It involves the study of conditions under which the healthy eye may function and still remain healthy quite as much as of the conditions under which the individuals handicapped by abnormal vision may obtain the best visual efficiency. Conservation in this field is of special importance, because the eyes are neglected and abused more than any other organ in the body and are more often permitted to go without treatment or help of any kind. The function of sight is the most important special sense inherited by man, and unfortunately most of us take our eyesight for granted and never think of it as the greatest of our personal treasures which should be guarded constantly.

To more fully appreciate the necessity for conservation measures as applied to the eyes, it is necessary to be acquainted with the results of ocular neglect. That we have not attained a high efficiency in this respect is evidenced by the following:

The last survey of the American Foundation of the Blind states that in 1930 there were 114,000 blind in the United States, or 0.9 per 1,000 inhabitants. It has been conservatively estimated that 72 per cent of all cases of blindness are preventable, and that, with advancing knowledge and increasing care, practically all blindness may be prevented.

To be informed as to the type of eye conditions which fall into the above group, we should review the statistics of any institution for the blind. For example the following causes of blindness were found in cases admitted to the Minnesota School for the Blind during the period from 1925-26 inclusive.

	Per cent
1. Congenital and hereditary.....	38
2. Interstitial keratitis and other luetic causes.....	22
3. Injuries	10
4. Ophthalmia neonatorum	8

5. Trachoma	56
6. Refractive errors	8.78
7. Infectious diseases (measles, etc.)	6.80
8. Other causes—unclassified	4.82

We have here a great field of human service. It should be kept in mind that these statistics apply to but one phase of the subject and our problem has a much wider scope. We should not only consider the so-called important ocular conditions but also the seemingly commonplace conditions of the eye. The problem should therefore be viewed as a whole and the various ocular conditions in all periods of life considered. These periods include the care of the prospective mother, the child at birth, infancy, childhood, the school years, and the adult period extending to the later years of life.

Starting in a chronological sequence, let us consider some of the causes of visual loss. Many ocular tragedies can be prevented if before the birth of the child proper treatment is instituted. In a large percentage of cases, treatment of the mother protects the child against diseases such as syphilis. These prenatal afflictions of the child's eyes in many cases can be avoided if the obstetrician will take the necessary precautions. Likewise, during the birth of the child, ocular damage may occur due to prolonged labor or the use of forceps. Immediately after birth the baby should be examined for congenital defects. Early care may greatly modify the outcome.

Hereditary conditions are not uncommon and every ophthalmologist has had experience in dealing with them. In 1,024 families in which hereditary blindness prevailed, Loeb found that 60 per cent of the 4,155 children produced had inherited eye defects. Hereditary defects other than those of refraction may be present, such as undeveloped pupil or choroid, glaucoma and displaced lens. These are difficult to cope with, but demand early attention. The most common and important defect from our standpoint is congenital cataract.

Many babies become blind because of ophthalmia neonatorum. A generation ago, ophthalmia neonatorum caused more than one-fifth of the

cases of blindness in children. As a result of organized effort, recent admissions to institutions show only one in twenty, or one in fifty, blind from ophthalmia neonatorum, whereas formerly one child in five, or even one in three, was blind from this cause.

Trachoma, an infectious disease of the conjunctiva, is still an active agent in producing poor vision and in destroying sight. It is still the chief cause of blindness in some countries. We are fortunate in this country in having it controlled by the immigration laws which prohibit anyone with trachoma from entering the United States.

Focal infections, syphilis and tuberculosis hold a prominent place as the most prolific sources of blindness. Focal infection is a major cause of eye diseases. In such cases a localized area of disease occurring in remote parts of the body gives rise to iritis, choroiditis, or retinitis, which may terminate in blindness. Tuberculosis may involve any part of the eye, and is a prevalent disease frequently encountered in seemingly healthy young adults. Syphilis is the activator in many ocular tragedies and may destroy sight by its action on the blood vessels of the eye, causing such conditions as interstitial keratitis or choroiditis. It may act also by direct effect upon the nervous system as occurs in locomotor ataxia or general paralysis.

Detachment of the retina, which is usually a sudden separation of the retina from its choroid base, may follow an accident or develop in a seemingly healthy eye, although it occurs much more often in an eye which is myopic.

Glaucoma is the attributed cause of one-seventh of adult blindness among the afflicted persons recorded in our last census.

Old age brings changes which frequently lead to loss of vision. If the crystalline lens becomes opaque as a result of age, it is referred to as a cataract. Cataracts can be removed in an otherwise healthy individual with perfect results, restoring vision. There are no drugs, treatments or devices which alter the progress of a senile cataract.

Of late there has been much in medical literature of the danger to eyes from cosmetics. In certain cases that are sensitive, the dye coming in contact with the eyes sets up an inflammation of the conjunctiva and cornea. If its use is not promptly discontinued visual impairment may en-

sue. Other patent preparations may be harmful. An example is thallium, which is used for the removal of hair from exposed parts of the body. Being absorbed, it may affect the optic nerve and cause blindness.

Our modern life has greatly complicated the accident problem and every oculist can enumerate case after case of accidents to the eye which could have been avoided. Although the eyes are protected by the overhanging bony orbital ridges, by eyelids and eyelashes, many are injured. The largest number of industrial accidents are caused by flying particles such as emery, iron specks, steel chips, pieces of copper, splinters of wood, cinders, glass or brass. These frequently lodge in the cornea and if they become infected, or if they are unskillfully removed, a corneal ulcer may develop with secondary loss of vision. If a foreign body inside of the eyeball is not removed, there is grave risk of losing the eye. We should keep in mind the possible danger of sympathetic ophthalmia in perforations of the ciliary body.

Another type of ocular defect which causes loss of visual efficiency is refractive error. These errors are commonly referred to as hyperopia or farsightedness, myopia or nearsightedness, and astigmatism. It is most important that refractive defects should be recognized early before faulty habits become established. The first six years of a child's life coincide with a significant period of eye growth and with the development of important visual powers. If this development is to proceed normally, children must be unhampered by visual defects.

The care of children's eyes is, therefore, of special significance in the prevention of visual defects, because, lacking mature development, they are very vulnerable to fatigue, and improper care leaves changes of much more serious importance than found later in life. To emphasize more fully the dangers confronting the child's eyes, let us study the following statistics. A recent survey in the public schools of Pennsylvania, which included a group of 200,000 children in kindergarten through the twelfth grade, revealed that 20 per cent of the children were suffering from defective vision or eye strain. These findings conform with conclusions arrived at by other investigations. Reliable authority states that there are five million children attending the elementary schools in the United States

who have eye defects. Other estimates state that approximately two million of the school children are retarded in their studies because of their eyes, and the cost to the public school system throughout the land by this neglect is around 130 million annually. Records reveal that up to a few years ago, even simple eyesight tests were given to less than 17 per cent of the children enrolled. At the present time this percentage is still very low, especially in the rural areas where practically nothing is being done concerning visual checks. Conservation of vision is also an important health problem in college students. During this educational period, many young people discover that all is not well with the visual organs, and poor vision and other signs of eye strain often appear for the first time. In a recent report of the Eye Health Committee of the Student Health Association, it is stated that of 1,250,000 colleges students in the United States, an estimated 15 to 25 per cent enter college with more or less serious ocular defects and many more develop during the college years. These statistics are impressive and drive home the magnitude and the importance of the problem of conserving vision in our young people.

The important thought to remember is that the eye of youth is a growing eye. Like the mind and body it is not mature and its health must be safeguarded. We cannot expect an immature eye to perform the work of a mature eye, or to work under handicaps, without its mechanism being impaired. This point is repeatedly brought home to the oculist who is confronted with these problems in his daily work. Eyes which are performing duties far in excess of their strength, and eyes which are working under a severe handicap, will suffer irreparable damage unless conservation measures are adopted.

Of refractive errors the most difficult to contend with is myopia. In this condition there is usually a hereditary factor as the basis. It is particularly important during school life, because this is the time that it usually develops and increases most rapidly. Rapidly progressive myopia must be considered as an individual problem. The most skilled care is required and mass treatment will not suffice. Every parent must be taught that long delay is dangerous, poor care costly, and coöperation essential, for, if proper measures are not taken, nothing can be done to control the progress of the disease.

Contrasted with the myopic eye is the hyperopic eye. Youngsters with such eyes usually read normally when tested, and a common error concerning the hyperopic eye is that, if the child can see clearly, his eyes are considered normal and are fit for school work without glasses. It is important to remember that farsightedness, unless of unusually high degree, allows clear vision at near and distance.

In children, eye strain is insidious; that is, children in the majority of cases may not be conscious of any eye trouble. Headache or eye fatigue is seldom complained of. Eye strain may be discovered by a combination of some of the following symptoms or signs: red eyes, watery eyes, cross-eyes, squinting or scowling, awkward tilting or twisting of the head, holding the book close to the eyes, sensitiveness to light, nervousness, inattention, lack of concentration, and subnormal sharpness of vision. This latter sign is the best guide, but usually this requires testing, such as is given by the oculist. Many times children so affected are considered backward. These youngsters become discouraged and frequently their personalities become warped. Uncorrected hyperopia, with or without astigmatism, is often the origin of distaste for reading and other school work. The healthy child does not like to be punished by eye strain, and without thinking much about what his sensations are, he avoids instinctively those sensations which are unpleasant. This may cause his entire education to be a failure, but it does save his eyes and nervous system from harm.

When everything has been done to relieve and correct all defects, there remains a small percentage of children, approximately one out of every five hundred, whose eyesight, even with the aid of glasses, is so impaired as to make it impossible for them to carry out the routine work of the school. In the United States we have about 44,000 of these little ones. When a child is found to have uncorrectable, defective vision of such a degree that he cannot see the usual type of the textbook, he should be admitted to a sight-saving class. The first sight-saving class was established in Boston in April, 1913, and at the close of 1935 we had about 1,000 such classes throughout the United States. Continued effort should be made for additional classes, for at least 5,000 are necessary, if a satisfactory educational program is to be pro-

vided for children with serious eye defects. If the defect is so great that a child cannot even see special work, then he must be taught in a private or state school for the blind.

There are a few points pertaining to glasses which seem sufficiently important to mention. The question is frequently asked, "Are glasses always prescribed when the child is examined by an oculist?" Decidedly, no. Many times the symptoms which suggest eye strain may be due to some other condition but an eye examination very definitely eliminates the possibility of a defective eye. Glasses are but one portion of the oculist's work; he examines the eyes from the medical aspect and looks upon them as part of the body. In his various procedures, the question of glasses is but one phase of his examination. With his medical background, he is in a position to analyze the symptoms and findings, and in a good percentage of the patients he finds that the problem is not glasses but some other physical derangement. He considers glasses the same as a crutch and prescribes them only when such special assistance is required. In the case of children, a good percentage of the eye trouble may originate from improper use. In many instances the weakness of the eye is due to head congestion or some other temporary physical upset. Even though the eyes may be slightly far-sighted with a small amount of astigmatism, the oculist knows from experience that such eyes do not require glasses and that under proper care the irritating symptoms disappear. In certain cases glasses may be prescribed as a temporary measure so that the eyes may receive the necessary relief during the very important development period.

The question of how frequently the eyes should be examined is many times asked. Eventually children will have their eyes checked at birth and following this at least yearly, the same as they now do their teeth. It seems far more essential to care for the eyes than the teeth, but usually it is found that emphasis is placed on the teeth rather than the eyes. By periodic checking, an eye defect may be discovered at a very early period and thus more ocular damage prevented.

Some parents do not approve of glasses for their children. If the child needs the glasses it may be an unpleasant necessity, but the fact that one dislikes to see a child with glasses does not

make it any less a necessity or any easier for the defective eyes to do school work without the glasses. For parents to object to an examination of the eyes of their child because they are afraid of the need of glasses, is to follow the example of the ostrich. To choose ignorance can never be considered a good defense against a danger. Periodic examination of the eyes of children is, therefore, worth while. It discloses all the defects and all the degrees of poor vision from which the human eyes suffer.

Another conservation opportunity deserves special mention, namely, children with strabismus (cross-eye). They constitute the largest single group in which there exists serious impairment of the vision in one eye. It is necessary to emphasize three well established facts: that treatment should be instituted the moment the strabismus is recognized even though the child is less than one year of age; that in a high percentage of children, crossed eyes can be straightened by means of proper and complete correction of refractive errors and with orthoptic training; and, most important, that the neglected cross-eyed child loses vision in the deviating eye unless measures are taken to correct the defect before the pre-school age. Vision once lost is rarely regained after the age of six. Almost daily, one is impressed with the fact that physicians, whose advice is first sought by parents of children with crossed eyes, do not properly appreciate the fact that this loss of vision occurs in the deviating eye and is avoidable. Amblyopia, or loss of vision in the deviating eye, results from involuntary suppression or inhibition of vision to prevent diplopia. If treatment can be begun at an early age, this amblyopia can usually be prevented, or vision can be reclaimed by proper treatment.

It is remarkable how many parents bring their children for examination on account of strabismus only when they attain school age, or for esthetic reasons. In some manner they too frequently gain the impression that treatment is unnecessary and without prospect of benefit until the child is ready for school. When informed that the deviating eye has defective vision, they express great surprise and, not infrequently, resentment against earlier advice they have obtained.

In the case of strabismus, preventive measures are of greatest value. It is a fallacy to believe

that cross-eyedness is outgrown. Instead, the earliest attention possible should be given. During the early years of life the glasses relieve the strain and in many cases the eyes adjust themselves. It seems advisable to re-emphasize that in these early years prompt attention should be given and careful supervision carried out because the turned eye does not develop normal vision. Later on when the child reaches school age, fusion exercises can be given to create the desire in the brain for the eyes to work together. Operations should be performed in most cases after the strabismus has become established, because treatment and glasses alone are not usually sufficient. The earlier the child is treated, the less likely is surgery necessary.

Even though the turned eye may be straightened by surgery the vision in this eye is poor and the child continues to use but one eye in seeing. This unilateral amblyopia or partial blindness is far more serious than it has actually been regarded. With the pursuit of various forms of strenuous athletic sports during boyhood, youth, and young manhood, the possibility of injury to the useful eye is a real hazard. The danger may be less during active adult life, unless the individual engages in some industrial pursuit, but it is ever present. It so frequently happens that when in adult life an injury or visually crippling disease occurs to an individual with one amblyopic eye, it is usually the better seeing eye that is the victim. It seems unfortunate that the amblyopia problem exists when we have it in our power to almost entirely eradicate it.

Another point of importance is the avoidance of ocular fatigue in a child. The child's eyes should not be used at close range to any extent compared with the adult. Prior to school days, the eyes looked when they pleased and at what they pleased, and for as long or as short time as they wished. Now they are put to work, and must keep at one job until it is finished, even if they are tired. The result is that much harm can be done not only to the young eyes but to the nervous system as well. We should therefore eliminate many sources of excessive eye strain such as the movies, prolonged drawing, etc., because they cause a high degree of fatigue.

Another important consideration in the prevention of eye defects is proper illumination and the elimination of glare. This problem be-

gins at the very earliest time in life. The problem of light in the school room is of vital importance and the schools as a whole are well and properly illuminated. Home conditions, however, need more supervision. Improper lighting is one of the most important factors responsible for industrial accidents today and the eye hazards of industrial occupation constitute one of the most serious causes of blindness. Fifteen per cent of all accidents are traced directly to poor lighting. Not only could the number of such accidents be materially reduced, but thousands of cases of seriously defective vision could be prevented.

What sort of examination should be made of the eyes? The best is none too good. A good examination will show more completely the exact nature of the disease or defect that is preventing good vision. The examination should be made by an oculist. He has at his command every aid that science affords, and the administration of a cycloplegic is optional with him. Cycloplegia is harmless, and a definite necessity in many instances because in no other way can certain conditions of the eye be uncovered and properly corrected. Cycloplegia enables the physician to measure the true refractive defect of the eye and it also allows him to view the interior of the eye in a thorough way. It is just as impossible to obtain an accurate view of the interior of the eye through a small pupil as it is to see the complete contents of a room through a keyhole. Our best authorities agree that an accurate examination through the normal pupil is impossible because the light from the ophthalmoscope causes the pupil to contract and obscures the complete view. This complete check of the interior of the eye is vital in order to eliminate the presence of early cataract, vessel and nerve diseases of the interior of the eye. We have in the eye a sample spot in the human body, which reveals what is often happening in other parts of the body. Organic weaknesses which affect the heart, kidneys, liver and other vital organs, often leave certain tell-tale signs in the interior of the eye. We should, there, remember that the eye is not an isolated organ, but frequently suffers from diseases of organs far removed, and an eye examination frequently reveals serious disturbances long before they make themselves manifest to either the patient or his attending medical advisor.

Despite all our efforts of prevention there still remains an appallingly large number of individuals who should not have become blind if all the factors tending toward blindness had been combated or eliminated. Fortunately, we live in a progressive age and when a need of this nature exists active measures are taken to obtain results. The National Society for the prevention of blindness, a voluntary organization founded in 1915, has made great progress in the field of visual conservation. It applies the facts advanced by physicians to alleviate the condition of the blind and prevent visual loss. It should be given much credit for the progress in saving vision. The medical men are becoming increasingly more aware of their tremendous responsibility in conserving vision and are taking active steps to combat the factors causing it. To the nursing profession much credit is due for its splendid efforts. The success of the program in the future to a great measure depends upon the nurse, because through her we have avenues of approach which are closed to the oculist.

There still exist certain angles which need further effort and if given proper attention will aid materially in reducing visual loss. One of the most important of these is acquainting the public with facts pertaining to visual matters. The layman should be thoroughly informed concerning the importance of early and regular care of the eyes. This applies to all phases of eye work and especially in the care of children's eyes. Lack of knowledge is the basic cause for ocular neglect. It is within our power to dispel much of this if we will use all the methods at our disposal such as the radio, parent-teacher associations, newspapers, and, most important, word of mouth. More lay groups should be organized, patterned after and working in conjunction with the National Society. If our women organize study clubs to study civic matters, why can't we divert their enthusiasm along this line? To a

great degree it is a question of directing effort in this direction and arousing an interest.

Another phase which is important to mention in this respect is a better fundamental training in eye work for the undergraduate physician and nurse. In many hospitals eye cases are a rarity and consequently the student assumes that ocular matters are of secondary importance. This thought is strengthened and confirmed by the brief course of instruction. The result is that they have very little knowledge or interest in eye cases, and naturally conservation of vision is a foreign subject to them. Let us revise our teaching program, and emphasize the eye more strongly.

In the routine care of patients we should be ever mindful of symptoms which may suggest eye defects because sometimes the eye gives the first clue to general disease. When the opportunity arises teach the parents to watch for eye symptoms in children, especially symptoms of strain or poor ocular coordination.

In conclusion: Prevention of visual impairment is not exclusively a problem confined to the oculist. It affects every branch of medicine. There is lately a growing appreciation for the value of sight and an increasing realization our eyes are not isolated organs, but are subject to many changes secondary to general health and disease. It must be remembered that the eyes are among man's best possessions, and deserve adequate care. Upon no other organ in the human body hangs quite so delicately the thread of happiness as upon the eyes, yet no organ is more active or restless. From early infancy to death, through all awakening hours they function ceaselessly. Considering that 90 per cent of our vast knowledge of the eye has developed in the past fifty years, there is much to be hoped for in the prevention of blindness and saving of sight, provided the individual does his part.

DEATH RATE STATISTICS

According to the latest report of the Census Bureau, the rate of 48 deaths under one year of age per 1,000 live births in 1939, was the lowest rate in the nation's history. In 1938 the rate was 51 and the figure has been decreasing steadily in recent years. Minneapolis' figure of 35.4 for 1938 was the lowest in the country and the figure of 38.8 for 1939 was among the lowest and well below the average.

PRENATAL CARE AND ITS RELATION TO THE LATE TOXEMIAS*

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AS suggested in the title of this paper, this presentation will not discuss prenatal care in its entirety but will be confined to the late toxemias only, especially those of the eclamptic type.

In recent years much emphasis has been placed on prenatal care as the means of affording the pregnant woman a greater chance of an uncomplicated pregnancy, a greater chance of having a full term living child and greater assurance of the restoration of her former good health. That such might be the case, pre-supposes, of course, that her prenatal care has been adequate and there are several important factors determining the adequacy of prenatal care.

Somebody has defined prenatal care as complete medical supervision of the pregnant woman; preventive rather than restorative. Any measure adopted to combat existing toxemia will prevent further extension of the disease.

That the pregnant woman may reap all the advantages of prenatal care, she must seek medical care and advice as soon as she is aware of her condition and then be faithful in keeping her subsequent appointments.

One visit to her physician in the earlier months of her pregnancy and after that no further consultations, or a first visit in the last trimester of her pregnancy, or when headache, edema, or other signs of toxemia present themselves, does not constitute adequate prenatal care. No patient need apologize for seeking advice as early as her second missed menstrual period.

The Children's Bureau of the Department of Labor recommends that the first visit to the clinic or physician be made at or before the fifth calendar month. This might create in the mind of the patient the idea that it is safe to wait until the fifth month. Many things may happen to a pregnant woman in the first five months of an unsupervised pregnancy.

Visits should be made every month for the first seven months and then every two weeks or oftener if any important or suggestive symptoms arise.

Thomas and Clahr⁵ reporting from the Morristown City Hospital of New York, which is a municipal institution, state that, "despite the gratuitous nature of this service, not one patient applied for prenatal care before the sixth month of gestation," and, "many patients are of the opinion that registration at the prenatal clinic was a necessary preliminary to future hospitalization. Some of these late comers were even aware of having had toxemia in a previous pregnancy."

In Adair's¹ report he states, "Adequate prenatal care was received by twelve per cent of the women whose deaths could be traced directly to toxemia of pregnancy."

In a review of 515 maternal deaths from late pregnancy toxemia in North Carolina, from 1932 to 1936, Bradford² of Duke Medical School found that only twelve patients had received adequate prenatal care (2.3 per cent): 252 were seen for the first time late in their pregnancy either in convulsions or with advanced toxemia; seventy received their first medical attention when in labor; seventy-three saw a physician for the first time after delivery; and in 108 cases there was inadequate prenatal care. Bradford states without any hesitation that one of the most important contributing factors to this high mortality is just plain every-day neglect.

de Snoo of Utrecht, Holland, is quoted as reporting, "over a ten-year period in his clinic, 20,000 deliveries with twenty-seven puerperal deaths, but not a single death was due to eclampsia, and when eclampsia did develop it was due to lack of coöperation on the part of the patient." Danforth⁴ says, "Eclampsia may be reduced so efficiently by painstaking care of pregnant women that we for years past have not had enough cases of this disease to teach internes and nurses to care for them."

These experiences serve to emphasize two facts. The first one is that public education has still much to do and the second one is that good prenatal care can and does accomplish much.

Another factor that contributes to the adequacy of prenatal care is that it must be complete. As far as the late toxemias are con-

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cerned, the patient must be interrogated about headache, nausea and vomiting, the presence of edema and the condition of her bowels. Her blood pressure and her weight must be taken and recorded at each visit and a specimen of urine, preferably of the twenty-four hour excretion, must be examined.

Prenatal care to be adequate must also be intelligent. Steps must be taken to combat unfavorable signs and symptoms. The causes of headache, edema, excessive or sudden gain in weight must be ascertained, and efforts put forth to combat them, and a gradually rising blood pressure must be regarded with suspicion.

Dieckman speaks of prenatal care as having been adequate in some cases but not intelligent. Any prenatal care that is not at the same time intelligent falls short of being adequate. He expresses popular opinion when he states, "prenatal care will not prevent non-convulsive toxemia of pregnancy, but it will, if the various abnormal symptoms and signs are intelligently interpreted, prevent the occurrence of eclampsia and severe pre-eclampsia."

We have not mentioned the symptoms of blurring of vision or epigastric pain because we feel that when these two symptoms make their appearance, the toxemia has advanced to a serious stage and that the patient is on the verge of eclampsia. In this presentation we are concerned rather in a discussion of the prevention of these severe symptoms.

In an attempt to carry out this prenatal program of preventive medicine, there are at least six special symptoms which call for consideration, namely headaches, nausea and vomiting, edema, albumen, mounting blood pressure, and excessive gain in weight. These are not all of equal significance; some are very important and others have only a relative value but the multiplicity and the severity and persistence of the symptoms indicate the seriousness of the toxemia. There is nothing characteristic or diagnostic about the headache of early toxemia. A headache may be due to eye strain, poor sleep, hunger, sinus infection, or poor elimination, and many other reasons, but headaches which are unusual and persistent and tend to become worse must be regarded with suspicion, especially when associated with any of the other symptoms.

Nausea and vomiting in the earlier months of pregnancy are almost a universal symptom of

pregnancy, but when nausea and vomiting return after an absence of several months they are of an entirely different significance and may be a symptom of toxemia although many other conditions, which are rather negligible factors, may cause nausea and vomiting.

The same may be said about edema of the ankles. Many factors may produce it such as pressure of the pregnant uterus, varicose veins, and even an old injury such as a fracture. This type of edema will disappear rather rapidly when the patient goes to bed for a day or so and is often about all gone when the patient arises in the morning.

The remaining three symptoms of albumen, blood pressure, and weight are the most important and a greater significance must be attached to them. The presence of albumen in the patient's urine does not call for much comment; it is either present or it is not present. If present in any marked quantity as determined by ordinary test, a quantitative determination should be made of a twenty-four hour output of urine to note if it is on the increase or not. Williams states that any patient is in serious condition who has albumen present to the extent of one gram per litre.

There is a right and a wrong way to take the patient's blood pressure. It should be taken only after the patient is at physical and mental rest and before a physical or bimanual examination has been made. Many patients amuse themselves by keeping an inquisitive eye on the bobbing column of mercury in the blood pressure instrument. Of course no reading is accurate under such or similar conditions. The blood pressure reading taken at the patient's first visit is important, as it marks the patient's condition at the outset, but it is often a higher reading than her normal because of an uncontrolled mental alertness due to the experiences of a first visit to her doctor. Several readings should be taken before one should feel satisfied as to the correct reading, since a first reading may be ten or more points higher than subsequent ones. Two or three readings at the same point may be regarded as the correct one.

It is well to remember that fatal cases of eclampsia have occurred when the patient's blood pressure never rose above the normal. These are the fulminating types and doctors are rather helpless in the presence of such a condition. The

blood pressure that shows a tendency to gradually creep to a higher level, although never being unusually high at any time, is a pressure that must be regarded with suspicion. Any blood pressure that reaches a systolic of 150 or a diastolic of 100 can no longer be regarded as that of a normal pregnancy, and Lynch showed many years ago, in a large group of closely observed pregnant women in his clinic, that a disturbance in blood pressure took place before albumen appeared in the patient's urine.

There is no doubt but that at the present time the gain in weight of the pregnant woman from month to month is receiving fully as much consideration as her urine and her blood pressure. Any excessive gain which cannot be explained on any other basis is regarded as an occult edema which has not reached the stage of clinical edema and Cummings³ states, "a rapid or excessive gain in weight in the eighth and ninth months were the results of fluid retention and appeared several weeks before definite edema or albumen could be demonstrated."

The patient often asks how much gain in weight is to be expected or is normal. Cummings, in his study of 1,000 patients, has found the gain in weight to be none to one, one, four, four, five, five, three and three pounds respectively in each of the nine months of pregnancy, or a total of twenty-four pounds. None of this weight was gained in the first trimester, and all in the second and third, which, when reduced to a practical every day workable basis, means an average of one pound gain per week in the second and third trimesters. This applies equally to primiparous and multiparous women.

Weldon of Mobile is quoted by Cummings as having adopted a standard of twenty-five pounds as normal gain, and Danforth is of the opinion that weight should be restricted to twenty-five pounds at the most. In Cummings' series of 1,000 cases, 237 had albumen and all of these had gained over thirty pounds in weight. Another observation was that women gaining more than thirty pounds had 50 per cent more signs of toxemia than those gaining twenty-four pounds or less. Babies of ten pounds or more were often born to mothers who had gained on an average of thirty-three pounds. Danforth denies that the weight of the mother has anything to do with the weight of the child, but women who gain excessively are more likely to become toxic.

In order to determine for ourselves the merits and advantages of prenatal care, and to ascertain if the pregnant woman who has adequate prenatal care fares better than her pregnant sister who has had no prenatal care, we have studied the charts of all the obstetrical patients admitted to the Ancker Hospital in a five-year period, 1933-1937 inclusive, and in whom the diagnosis had been made of "toxemia of pregnancy, with or without convulsions."

In all there were 219 such patients. However, in forty-one of them we thought we failed to find sufficient evidence recorded on the clinical chart to warrant this diagnosis and these charts were discarded, leaving a remainder of 178 cases for study. However, to exclude these forty-one cases may have been an error because every patient of this group sent into the hospital from the prenatal clinic exhibited some sign or symptom of toxemia such as headache or edema or elevated blood pressure or sudden gain in weight, and one is not in a position to deny that hospitalization prevented further development of these symptoms.

Of the remaining 178 there were fifty-six patients in this group (31.5 per cent), who had no prenatal care at all. There were 102 (57 per cent), who had four months or less of prenatal care and only twenty (11 per cent), who had more than four months. About 89 per cent of these women had either no prenatal care at all or four months or less.

Of the total number of 178 cases of toxemia found in the prenatal clinic, seventy-seven patients were hospitalized because of the presence or increase in severity of the symptoms. In thirty-one of these, labor took place spontaneously, although the patient was not in labor at the time of her admission to the hospital; in twenty, labor was induced for sufficient reasons and by various methods while twenty-six improved sufficiently to be allowed to go home again. Of this last group, twenty-one returned later on and delivered spontaneously; in three labor was induced, one delivered elsewhere and one died of eclampsia undelivered.

Thirteen patients developed the convulsive type of toxemia. Of this number, eight had had no prenatal care at all, while the remaining five had had some prenatal care, although only one and two months. Of the fifty-six patients who had had no prenatal care at all, eight, or one in

seven, developed convulsions; while in the 122 who had had prenatal care, five, or only one in twenty-four, developed the convulsive type of toxemia. In other words, convulsions developed three and one-half times as frequently in those women who had had no prenatal care as in those who had this type of supervision.

There were twenty-eight fetal deaths in this series or 4.4 per 1,000 of live births. The various causes of death were largely what might be expected and were due to pathology so frequently associated with the late toxemia. In six cases premature separation of the placenta is recorded as having taken place; in one case the cord prolapsed; there were two cases of fetal anomalies while autopsy revealed macerated fetus seven times, prematurity ten times, and cerebral hemorrhage twice. In twelve instances the mother had had no prenatal care and in no instance did she have over three months.

This shows the disastrous effects that lack of prenatal care has on the life of the baby in utero.

The essential features associated with the five maternal deaths are as follows:

Case 1.—One and one-half months prenatal care—hospitalized with 4 plus albumen—delivered spontaneously—premature living frank breech—chill two weeks post-partum—died four weeks post-partum. Cause of death: Chronic suppurative salpingitis, tubo-ovarian abscess, peritonitis and colon bacillus was isolated.

Case 2.—One month prenatal care—hospitalized—induced with bag and vaginal packing—delivered in breech a macerated stillbirth—died on 9th post-partum day. Cause of death: Toxemia of pregnancy. Pulmonary embolus. Acute endometritis.

Case 3.—No prenatal care—hospitalized with convulsions—no improvement under conservative care—sectioned—living 13 lb. baby delivered: Mother died of convulsive toxemia.

Case 4.—No prenatal care—hospitalized with convulsions—delivered spontaneously—premature living child—chill on 2nd post-partum day—died on 14th post-partum day. Cause: Puerperal sepsis.

Case 5.—Two months of prenatal care—hospitalized at seven months—after ten days and with normal blood and urine, no complaints and growing restlessness she was allowed to go home although blood pressure 184 systolic—after 18 days re-hospitalization was advised but she delayed a full month longer—entered with convulsions—had three in rapid succession and died undelivered. Cause: Eclampsia and pregnancy.

The thing that impresses one in reading these case histories is that two of the patients who died had no prenatal care at all and all the others had care over too short a period of time and perhaps none of them made more than one or two visits to the clinic.

Summary

Too many women in our series had no prenatal care and too many had care over too short a period of time. Efforts to prevent the severe types of toxemia of pregnancy must be directed along the line of more adequate prenatal care.

Hospitalization of pregnant women when the signs of toxemia presented themselves afforded an opportunity for the induction of labor in 26 per cent of them and caused improvement in another 34 per cent. Less than one-fourth of the convulsions occurred in the hospitalized cases.

Convulsions occurred three times as frequently in the women without prenatal care as in those who had prenatal care.

Prenatal care should be the outstanding concern of the pregnant woman. This type of observation is a definite method of reducing the incidence of the severer types of toxemia, and absence of adequate prenatal care is a definite factor in the incidence of premature and stillborn babies.

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TUBERCULOSIS AND PERSONALITY

The "Magic Mountain" personality of the tuberculous, described by Thomas Mann is symbolic of their uncertainty, mental unrest and feeling of social insecurity. It is due to the failure of the public to understand the tuberculous. Fear that the patient experiences about the attitude of others makes him depressed and nervous, gloomy and unfriendly and ashamed of his illness. The cured tuberculosis patient should have a fair chance to return to normal life.—MORTON A. SEIDENFELD, *Science News Letter*, Dec. 9, 1939.

SULFATHIAZOL IN OTOLARYNGOLOGY*

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THERAPY in otolaryngology acquired a momentous adjunct in the discovery of sulfanilimide. As in other fields of medicine there has been a two-fold sequel to the realization of its value, first in its application to an extent far greater than originally conceived, and second, a stimulation in the search for analogous drugs with specific bactericidal properties against pneumococcic and staphylococcic infections. The synthesis of the sulfapyridine derivative of sulfanilimide and its potency in pneumococcic, and even staphylococcic, meningococcic, and gonococcic infections was the forerunner to another seemingly even more valuable derivative of the parent drug.

The use of sulfapyridine in pneumococcic and staphylococcic infections has been retarded by the same kind of toxic manifestations which occur with sulfanilimide, along with a tendency to nausea and vomiting. When used in severe infections the necessarily prolonged administration plus the slow metabolism of the drug brought the side effects of vertigo, headache, malaise, and a distressing lethargy and depression. Cyanosis has been frequent, as have dermatitis, and liver and kidney damage. Neutropenia and a drop in hemoglobin have been immediate indications to discontinue use of the drug. An added disadvantage has been in two traits exhibited by the drug, first, a tendency to conjugate, with a loss of action of that percentage of the drug so acting, and second, the formation of an ineffectual acetylated derivative, both resulting in an erratic blood level.

Most of these undesirable side effects appear overcome with no loss of effectiveness in the newest derivative of sulfanilimide, sulfathiazol, the thiazole analogue of sulfapyridine, synthesized by Fosbinder and Walter²; and Lott and Bergeim.⁵ This compound, along with its methylated derivative, sulfamethylthiazol, both in vitro and in vivo action, possesses a bactericidal action against staphylococcus, streptococcus, and pneumococcus similar to sulfanilimide and sulfapyridine but has numerous points of superiority.

Herrell and Brown³ of Rochester experimented with these three drugs in connection with staphylococcus aureus growths in broth. Whereas in a control colonies were present in the ratio of 21,000 to 0.1 c.c. mixture. They were reduced to 28,000 colonies with either sulfanilimide or sulfapyridine, to 2,400 colonies with sulfathiazol, and to only fifteen colonies with sulfamethylthiazol. This checked exactly with investigations about a month ago along identical lines by Barlow and Homburger¹ who also went further in examining the action of the thiazol derivatives on Beta hemolytic streptococci and various strains of pneumococci. They found, first, that these newer compounds were 2 to 7.5 times superior to sulfanilimide in the treatment of experimental pneumococcal infections, and second, they compare favorably with sulfapyridine which, however, was determined to be 3.4 times more toxic than sulfamethylthiazol and 4.57 times more toxic than sulfathiazol.

A study of the pharmacology of these new drugs by Van Dyke, Greep, Rake,^{6a} and McKee,^{6b} reveals several significant points. Using various methods of administration and dosages in albino mice, sulfathiazol was repeatedly found less toxic than sulfapyridine. In monkeys fed sulfathiazol in dosages representing about three times the maximum human therapeutic dose now recommended there was no weight loss, where it was definite and often pronounced with sulfapyridine. None of the monkeys revealed gross or microscopic kidney damage on sulfathiazol while six or seven on sulfapyridine exhibited hematuria and albuminuria after a few days. The chronic toxic effects of sulfathiazol were less, as metabolic studies show the drug more rapidly metabolized and undergoing much less conjugation.

Sulfathiazol is found to disappear more rapidly from the blood and although the urinary excretion is the same over a twenty-four hour period, the elimination at the end of four and eight hours is double the rate of sulfapyridine. The proportion of free sulfathiazol in the blood is also greater, hence a lower blood concentration may be effective. The equal effectiveness as

*Read before the Minnesota Academy of Ophthalmology and Otolaryngology at Saint Paul, Minnesota, April 12, 1940.

shown in other studies by the same group along with the lower toxicity and more rapid metabolism at present stamps sulfathiazol as the more desirable therapeutic agent.

The fullest application of these drugs in diseases of the ear, nose and throat still remains to be determined, but clinical experiences so far reported indicate them to be valuable agents of reasonable safety, offering an important addition in the chemotherapy of otolaryngological infections or complications of pneumococcal or staphylococcal origin. A much lower mortality in cases of staphylococcal blood stream and cerebro-spinal infections will result if preliminary reports of laboratory and human experimentation continue to be confirmed.

At present, the use of the more potent sulfamethylthiazol is advised only in patients confined to bed and never in ambulatory cases, as there is a possibility of its use being followed by peripheral neuritis, and it is best restricted as yet to the more life-threatening complications as staphylococcal septicemia, pneumonia, or meningitis or other severe infections. The sulfathiazol is suggested for staphylococcal infections including bacteremia, osteomyelitis, sinusitis, otitis media, and mastoiditis. The lower toxicity and equal efficacy suggests it also for pneumococcal infections of the ear, nose and throat and their complications. A field still to be investigated is the efficacy in gonococcal infections of the eye. Lawrence,⁴ using established methods to determine the relative effects in vitro of sulfathiazol compounds concludes that they are superior to both sulfanilimide and sulfapyridine in their bacteriostatic action on gonorrhea, as well as on pneumonia Types I, II and III.

Dosage: In general the thiazol compounds may be given in the same dosage as recommended for sulfapyridine, although its lower toxicity allows larger doses for a longer period when a rapid reaching of maximum blood concentration is desired. From 30 to 60 grains may be given as an initial dose followed every four hours, day and night, with 15 grain doses for two or three days. The amount given at each dose may be decreased and the time interval between doses lengthened in conformity with the blood concentration and the clinical progress.

In less severe cases 30 grains may be given, then 15 grains every six hours, reduced as the condition indicates. Due to its rapid excretion

regular spacing of the total daily dose is recommended. In young children, 1.5 grains per pound of body weight spaced over the twenty-four-hour period is a basic dose.

Periodic determinations of the blood concentration are necessary, a level of 5 to 7 mgs. per 100 c.c. of blood being the range recommended. These determinations can be done with comparative simplicity using the powdered drug. Regular red and white cell counts, and urinalysis are important for early signs of any untoward action of the drug.

In the presence of undesirable side effects, as peripheral neuritis, or any of the toxic reactions associated with sulfanilimide or sulfapyridine, the dosage can be reduced by half if these reactions are mild or discontinued entirely. Large doses of vitamin B complex, upward from 25 mgs. three times a day, should be given intramuscularly.

Two case reports illustrating the therapeutic effect of sulfathiazol administered in average dosage, in two cases of staphylococcal otitis media and mastoiditis follow:

Case 1.—The patient, male, a physician, aged sixty-seven, had no previous history of ear or other disease pertinent to present illness. On February 14, 1940, after exposure to a cold wind on a beach in Florida, he developed pain in the right ear. An otologist incised the right membrane tympani twenty hours after the onset of first symptoms. Serous drainage ensued for eight days, then ceased, with recurrence of fulness, throbbing, and pain. During this time sulfanilimide was being administered, with sedatives and heat to the ear. Spontaneous discharge occurred with relief of pain, then ceased intermittently, which condition prevailed when he returned here, March 8.

The patient was first seen on March 9. The ear canal contained an exudate issuing from a small central perforation in the drum around which the mucosa was nipped out. Canal walls and mastoid were normal. Temperature was normal. Mastoid radiographs at this time revealed the left process to be entirely normal; the right mastoid showed normal pneumatization but with small type of cells predominating centrally. There was a diffuse increased density in the area particularly about the auditory canal representing changes due to infection and obliterating any detail of the antrum area. Radiographs repeated several times revealed the same density extending to the outermost cells of the process.

On March 14 the discharge suddenly diminished after which there was considerable pain and fulness in the ear. X-ray therapy was administered every day, with sedation, diathermy, and general measures. Sulfanilimide was discontinued while x-ray therapy was used. On March 16 the temperature rose from

normal to 101.8, the pulse was 114, there was general malaise, headache, and temporal pain. The leukocyte count was 13,950, with 72 per cent p.m.n.s and 20 per cent lymphocytes, 5 per cent monocytes, 2 per cent eosinophiles and 1 per cent basophiles. The urine was negative. Mastoid radiographs showed about the same density as the original films of five days before. The patient was hospitalized in the evening, and the next morning the temperature was 101.4 with the leukocytes up from 13,950 to 18,950. The hemoglobin was 88 to 93 per cent throughout his illness. The ear was again draining at this time. Cultures from the aural discharge on March 17, 19 and 22 revealed staphylococcus albus. Smears on these occasions revealed practically no other identifiable organisms. Sulfathiazol therapy was instituted four hours after admission, March 16, under the direction of Dr. Wesley Spink, in 15 grain doses every four hours day and night, with no other therapy. The temperature and leukocyte count for eight days was steadily downward to normal, after which time he was discharged from the hospital. A secondary rise in the leukocyte count has been followed by a gradual return to normal. The urine was negative at all times. The only untoward effect of the drug was a mild degree of nausea on the third day at which time the dose was reduced by half, but, with relief of nausea, reestablished at the original level the next day. The concentration of the sulfathiazol in the blood was determined on the third day of treatment and at 5-6 mgs. was deemed satisfactory. The drainage ceased on the fifth day and has not recurred since. During the sixteen days of the sulfathiazol therapy, it was maintained at 15 grains every six hours for four days after leaving the hospital, then at one-half doses every six hours for four more days. Slides of the mastoid x-rays taken during the sixteen-day treatment period show the extent of the original pathology and the clearing of the mastoid cells throughout the entire process. The drum has reassumed its normal appearance and the hearing is the same as before the onset of the illness.

Case 2.—Case 2 illustrates also the rapid therapeutic effect in a previously protracted case of staphylococcal otitis media and mastoiditis.

The patient, a male, aged 12 months, was hospitalized by a pediatrician on January 24, with an acute upper respiratory infection, the right ear drum inflamed, and serosanguinous discharge in the canal. On admission the temperature was 103.4, rising to 104 the next day. The leukocyte count was 18,500, hemoglobin 48, the urine normal. Right myringotomy was done. Neoprontosil was given, 3 grains every four hours, and temperature within the next four days ranged between 99 to 101 at which latter point on the fourth day the patient was discharged.

Readmission took place February 16 with the temperature 101.8, having been between 99-100 for the intervening nineteen days. Both ears had continued to discharge intermittently during this time.

On the second hospital day the left drum was incised; then on the seventh day the right was reincised.

The temperature varied from 99.4 to 104 the first three days, then 99 to 101.8, finally going to normal by the eleventh day. The white count was 17,150, the hemoglobin was 52, 45, and 50 per cent at three-day intervals. Neoprontosil was used again during this time. The patient was discharged when the temperature became normal, but purulent drainage from both ears was present.

I first saw the patient three days after his leaving the hospital the second time. Both ears had continued to discharge and on this day the temperature rose suddenly to 104; the child appeared acutely ill, had slept poorly, refused food, and had been crying a good deal. Both ears had profuse creamy purulent discharge which welled up as rapidly as cleaned. There were no mastoid or central nervous system signs. Smears and culture revealed a mixed streptococcal, pneumococcal and staphylococcal infection with but few organisms and large numbers of pus cells.

On comparatively large doses of sulfanilimide the patient's condition improved rapidly, the temperature became normal in a few days and one ear ceased to drain in about ten days. The general condition improved and the child began to gain weight. The left ear, however, never ceased to discharge, but there were no apparent complications.

On March 30, two and one-half months after the onset of the original infection, culture of the aural discharge revealed pure staphylococcus albus. A supply of sulfathiazol becoming available, the child was placed in the hospital for the third time, for administration of this drug.

Admission temperature was 100. Sulfathiazol was instituted in dosage of $7\frac{1}{2}$ grains every four hours with no other therapy of any kind. The leukocyte count on admission was 19,200. A mastoid radiograph report by Dr. Ikeda was "mastoid cloudy; air cells rudimentary but appear filled with exudate." The temperature was normal the next day and remained so. The leukocytes four days later dropped to 10,400 and again in two days were 10,350. Hemoglobin was 55 and 52 per cent. The aural secretion quickly diminished and after four days ceased entirely. The patient was discharged April 6, on the seventh day, using a reduced dosage of sulfathiazol. The ears still remain dry, temperature normal and general condition normal.

Conclusions

1. Sulfathiazol is less toxic than sulfapyridine and offers a valuable adjunct in treatment of pneumococcal and staphylococcal infections of the ear, nose and throat.

2. Sulfathiazol has proven in two cases a safe effective therapeutic agent in staphylococcal otitis media, and mastoiditis.

3. The need for the more potent drug, sulfamethylthiazol, appears restrictable to bed patients with severe staphylococcal infections.

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SIGNIFICANCE OF INHALANT ALLERGENS IN THE TREATMENT OF BRONCHIAL ASTHMA OF THE CHILD*

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A RECENT analysis of the cases attending the Pediatric Allergy Clinics has revealed interesting information of value to practicing physicians. This is especially true in connection with bronchial asthma, one of the most common of allergic diseases among children. The incidence of this disease is greater in males than in females. The hereditary tendency in asthma is very strong. There are many children with a bilateral hereditary influence and a corresponding early onset of symptoms. One-fifth of the cases start in infancy and about one-half have their origin in the preschool period of childhood. Three hundred and twenty-nine children with bronchial asthma were studied. A rather exhaustive search was made for the offending allergen or allergens. Placing the patients on any form of drug therapy was avoided as much as possible. The food allergens were found to be very important in infancy and early childhood while the inhalants were the most significant cause of the asthma in the latter part of the preschool period. An increasing sensitivity to the inhalants occurred during the school years. The pollens became very important at puberty. The food sensitivity of early life was occasionally followed in the same individual by sensitivity to inhalants which prolonged the asthma over a long period of time.²

The causative foods, inhalants, and pollens were discovered in 252 cases. In some instances the sensitivity was a single one, in other cases it was multiple.³ Fifty-eight children had at-

tacks of asthma associated with infections of the upper respiratory tract. These children had no definite indication of any sensitivity to a food, inhalant or pollen. Because tonsillitis occurred frequently in this group, the tonsils and adenoids were removed. In some of the children, the maxillary sinuses were also punctured, and tem-

TABLE I. CAUSES OF BRONCHIAL ASTHMA IN 329 CHILDREN

Allergens	No. cases	Per cent	Other	Excitants	No. cases	Per cent
Inhalants	122	37.0	Acute infections			
Pollens	78	23.7	of upper respira-			
Foods	38	11.5	tory tract		58	17.7
Inhalants and foods	5	1.5	Chronic infections			
Pollens and foods	5	1.5	of respiratory system		10	3.0
Inhalants and pollens	4	1.3	Unknown and potassium iodide used to treat		9	2.8

porary drainage was established by making so-called "windows" in the antrums. Thirty-eight patients obtained definite relief. The remaining twenty were not helped and a few of them were made worse by the operative procedures. The best results appeared in children of the preschool age. Ten children whose tonsils and adenoids had been removed many years before the time of admission to the clinic were considered to have asthmatic attacks based on chronic infections of the respiratory system. These children were started on vaccine therapy, the outcome of which will be reported in a future communication. Nine cases failed to respond to any form of treatment except the use of potassium iodide. This preparation produced a more or less specific result. Table I summarizes the 329 cases.

*From the Allergy Clinics and Services of the Department of Pediatrics, University of Minnesota, at the University and Minneapolis General Hospitals. Presented before the summer meeting of the Nicollet-LeSueur County Medical Society, North Mankato, 1939.

The treatment of the young asthmatic children with food allergy was made easy by the fact that elimination diets can now be made up for practically every case without producing any harm to the individual.⁴ The care of the older patients with inhalant asthma exclusive of the pollens was the most interesting. Two forms of treatment were considered. First, there was the hyposensitization therapy and second the elimination of the offending inhalant. The former was tried many times, especially in connection with house dust sensitivity. The results were very discouraging. In three cases, the inoculations precipitated a generalized eczematous eruption. All these children had had eczema during infancy. The elimination of the offending inhalant from the environment of the allergic child gave the best results. The ease with which this could be done depended on the inhalant involved. The incidence of sensitivities to the various inhalants is given in Table II.

TABLE II. VARIOUS INHALANTS CAUSING ASTHMA IN 122 CHILDREN

	No. cases	Per cent		No. cases	Per cent
House dust	33	27.0	Orris root	5	4.1
Feathers	27	22.1	Cat dander	3	2.5
Cottonseed	20	16.4	Silk	3	2.5
Horse dander	14	11.4	Glue (fish)	3	2.5
Cow dander	6	4.9	Kapok	2	1.7
Dog dander	5	4.1	Wool	1	0.8

The children sensitive to house dust were hard to handle in many instances. These patients gave strong reactions to house dust and very weak or no responses to feathers, cottonseed, hairs, wool or other allergens in the home. The active principle of house dust was not determined and the removal of this inhalant from the child's environment never was complete. As a result the children would have periods of relief which were terminated by sudden attacks of asthma. These attacks might be of short duration but often the asthma became progressively worse so that for a few days the child was very ill, and the duration of the period of convalescence was about one week. It was soon observed that the clinical manifestations to house dust varied with the amount of the inhalant in the child's home. Even when simple procedures were carried out, the response was most encouraging. Instructions were given to parents to prevent the child from being too active in the house. Jumping

up and down on upholstered furniture often caused wheezing. Cleaning with a vacuum cleaner was prohibited, especially in the presence of the allergic patient. The removal of heavy drapes, rugs, pillows, and over-stuffed furniture was recommended. If this could not be made to apply to the entire home, a section of the house, or at least the bedroom, was arranged to fit the recommendations. A visit to the home by the physician to check the improved conditions was helpful.

The feather sensitivity was taken care of quite easily. All pillows, mattresses, cushions, upholstery and quilts containing feathers of any kind were removed from the house. Birds, such as canaries or parrots, were not permitted in the home. The child on the farm, who was found sensitive to feathers, was watched closely by his parents in order to prevent his contact with the domestic fowl. On occasions when the patient disobeyed and entered the poultry pen, he became the victim of a violent asthmatic attack. Often this was a clear warning to the parents of the extreme sensitivity of their child to feathers.

The children with the cotton or rather cottonseed sensitivity were most interesting. At first very little progress was made with these cases, but as more and more information was obtained concerning the various uses of cotton in the home the physicians were better able to cope with the problem, and soon more satisfactory results were noted. The sensitivity to cotton is in the average case due to the protein of the husks and the protein of the cottonseeds, the former protein being considered by some writers to be the most irritating of the two. Dust made up of minute particles of the cottonseed can penetrate into the deepest part of the lungs, thereby quickly producing an irritation. Only those individuals extremely sensitive to cotton give reactions to the fiber, free of the cottonseed.

The source of cottonseed dust in the home is linter cotton. After the ginning machine removes the lint, there remains about the cottonseed a woolly covering of short fibers which is known as fuzz. When this is removed by the seed-delinting machine, it is called linters. The material varies in color, ranging from gay, yellow and green to brown. The color depends largely on the closeness of the cut. The more fuzz that is removed from the seed, the darker is its color because the fuzz is darkest near the

seed. The color of the linters is also darker when there is much dust and other foreign matter present.

The treatment of the children sensitive to cottonseed (Fig. 1) was the removal of as much linter cotton as possible from the patient's environment. In the home this material was found in mattresses, studio couches, day-beds, upholstered chairs, cushions, pads and comforters. The cheaper articles of furniture contained the poorer grades of the dark brown linters. Mixed with it was a large number of small particles of the cottonseed. The elimination or reduction of the dust arising from the seed particles was handled in three ways. First, an attempt was made to remove as much of the furniture containing linters cotton as possible from the child's environment. Second, dust-proof covers were recommended for certain articles of furniture. Third, special mattresses and cushions were obtained when the purchase of new furniture was made. The first recommendation was especially directed toward the removal of old worn-out pieces of furniture in which the cottonseed of the linters had been pounded into a fine dust from years of service and in which there was also a danger of mold growth, emphasized by some writers as an added factor in connection with cotton sensitivity. The dust from the furniture was considered to be a more potent allergen as the furniture, and therefore linters, became older. It was most important to remove this furniture from the child's bedroom and if practical from other parts of the house.

The dust-proof covers were recommended for mattresses, pads and cushions. The parents were given two specific directions: one, to make airtight encasings for these articles by sewing them on or closing them with a zipper rather than merely wrapping them with covering material, and two, to use cloth impregnated with the new synthetic rubber-like preparation instead of cloth coated with a thin layer of real rubber, for the latter does not wear well, eventually cracks, and thereby permits the escape of dust. On the other hand, the synthetic rubber wears well, withstands heat and perspiration, and has the advantage of being washable.

The special mattresses and cushions were made of materials which were not considered to be important allergens. A fairly thick layer of sisal was placed over the inner-spring type of

construction, and the sisal was covered by a good grade of clean cotton, containing a few remnants of leaves but no cottonseed and referred to by some mattress manufacturers as staple cotton.

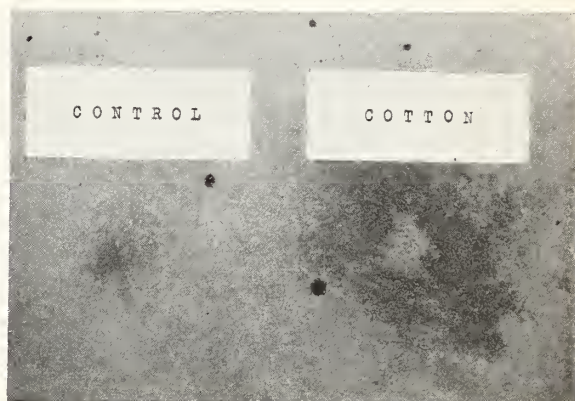


Fig. 1. Typical pressure-puncture skin test reaction to the cotton-cottonseed extract in a child with bronchial asthma, who improved at once when linter dust was removed from his environment.

This type of mattress was not expensive and its construction indicated that it would withstand years of service. The new foam sponge (rubber) mattresses and cushions were not overlooked. They were, however, found to be more expensive than the special cotton articles of furniture, and their durability was still being questioned.

The children sensitive to animal emanations did not present a difficult problem. Most of these patients came from the rural districts and arrangements were made to keep them in the larger towns or cities away from the farm animals. Occasionally the parents were not convinced that this was the best form of treatment and so the child was allowed to go home, where he soon developed another asthmatic attack. When this occurred, the patient was gladly returned to the city. Here the only danger was the dog and the cat. These animals were always promptly removed from the child's environment.

The patients who gave marked reactions to orris root, silk, kapok and wool responded favorably when these inhalants were removed. Not much difficulty was encountered. There were two observations made in connection with orris root in that some of these children became violently ill after being in a theater and others did not do well until every member of the family had started using non-allergic cosmetics.

The children with fish-glue sensitivity were

hard to treat. Removal of old books and other articles made with or from glue did not help. Hyposensitization was tried and the results were encouraging. Further studies are indicated, however, before any definite conclusions can be made.

Finally the relationship of weather changes to the attacks of asthma was observed. Some physicians have felt that weather had no influence on the asthma; others have accepted the statements of the parents that sudden changes in weather do precipitate attacks of asthma, and this clinical belief has been confirmed by the recent work of Preuner.¹ He showed that in experimental asthma in guinea pigs a measured amount of an excitant produced a greater degree of asthma in a shorter period of time when weather conditions were changing than when they were constant. Thirty-seven of the children had asthmatic attacks with practically every sudden change in the weather in spite of the fact that measures had been instituted to make them free of asthma during the interim. Twenty-five of these patients were sensitive to inhalants, five were pollen asthmatics, three had food allergy and four were considered to have chronic infections. The majority of cases sensitive to inhalants gave reactions to house dust. Probably the fact that this allergen could never be completely removed from the child's environment predisposed to his susceptibility to the weather changes.

Summary and Conclusions

1. An analysis was made of 329 children with asthma attending the Pediatric Allergy Clinics at the University and Minneapolis General Hospitals.

2. The inhalant group of allergens exclusive

of the pollens was the cause of asthma in the largest number of children. House dust, feathers and cottonseed were the most important inhalants.

3. Hyposensitization therapy for the inhalant allergy did not give encouraging results.

4. The children sensitive to house dust were difficult to treat because this inhalant could be reduced but not completely removed from the environment.

5. The cases sensitive to feathers responded well to the thorough removal of the inhalant.

6. At first the children sensitive to cottonseed presented a difficult problem, but with the reduction or elimination of the linter dust from the environment good results were obtained. To take the place of some of the articles of furniture containing linter cotton, special mattresses and cushions were ordered to be made up of materials considered to be very weak allergens.

7. The patients sensitive to animal emanations and some of the other inhalants were easily taken care of by more or less routine measures. The only exception was in connection with the fish-glue sensitivity. The children sensitive to this allergen required the hyposensitization therapy, the results of which were fairly good.

8. Sudden changes in the weather did have some influence on the asthma, especially in children sensitive to house dust.

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EWING'S TUMOR (HEMANGIO-ENDOTHELIOMA; ENDOTHELIAL MYELOMA; SOLITARY DIFFUSE ENDOTHELIOMA): A PROBLEM IN DIFFERENTIAL DIAGNOSIS*

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PRIOR to 1922, Ewing's tumor was considered by some surgical pathologists as a round-cell sarcoma of bone. In the years that followed, this type of tumor became more readily recognized

due to its peculiar clinical behavior and its specific reaction to irradiation. The tendency of this tumor to destroy bone, periodicity of symptoms with complete remissions of pain and its almost characteristic roentgenologic appearance have all received attention by various authors when reporting the subject. As a result, in re-

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cent years, the profession has been stimulated in its investigations of the condition.

It has been our experience that to distinguish between Ewing's tumor and osteomyelitis is of great importance; in the earlier phases this problem is more difficult than in the later ones. The seriousness of distinguishing between a malignant neoplasm and a benign inflammatory lesion is obvious; errors in diagnosis continue to occur, however, taking their toll in human life and suffering. An illustration of the status of diagnosis of Ewing's tumor shortly after the original description of the condition by Ewing is demonstrated in our first case to be reported.

That Ewing's tumor is not the pathologic rarity, among malignant bone tumors, that it is generally believed to be, is shown in a recent review of malignant tumors made by one of us (Meyerding). From this study, it was shown that Ewing's tumor (endothelial myeloma) formed 26.9 per cent of the primary malignant lesions of bone. In one case out of every 7,666 encountered at the clinic, the diagnosis of Ewing's tumor was made; no doubt it is possible that its occurrence in the general practice of medicine is even less frequent.

While the disease may evince itself in those persons of more advanced years, like osteomyelitis it tends to occur more commonly in the younger age groups. In our series of 114 cases of Ewing's tumor, 66.8 per cent of the patients were less than thirty years of age. Males are undoubtedly more prone to be the victims inasmuch as 71.9 per cent of the patients were males; 28.1 per cent were females. The middle of the shaft of long bones is the site of election and of all the bones affected the femur appears to be the one most commonly involved. The probable localizing factor, if we can speak of it as such, is trauma, a fact which is true for osteomyelitis, also. When dealing with young subjects, however, it is exceedingly difficult to assess accurately the true degree and value of an injury, as this is so common an occurrence in adolescence. Frequently in cases of Ewing's tumor, the patient is able to describe a definite and related injury (35.1 per cent), prior to the occurrence of swelling and pain in the limb, subsequently proved to be the site of tumor formation. Thus, some consideration must be accorded to trauma as an etiologic factor. Pathologic fracture as the initial symptom of this disease is not a common

occurrence, although as a late complication it may be present, constituting 15.8 per cent of those in our series of cases.

Pain is the early and most characteristic symptom of osteomyelitis and Ewing's tumor. Although at first vague and transitory, it becomes severe and constant in the later stages. Nocturnal exacerbations render sleep fitful or even impossible and contribute, with toxemia, to the lowered health and general "run-down" appearance of these patients. The pain of any acute infectious process tends to be constant, throbbing and progressive and in these features we have points which sometimes help in making a diagnosis, since the pain of a Ewing's tumor usually shows intermissions which vary from days even to months. Swelling of the part with local tenderness to pressure and an elevated oral and local skin temperature are common to both conditions but in cases of osteomyelitis the ranges of fever are usually greater and hectic in type. Local edema and reactionary synovitis of the neighboring joints are suggestive of an acute infective process rather than of a tumor. Blood investigations do not help much since both may be associated with a variable degree of deficiency of hemoglobin and in both a definite leukocytosis may occur. Occasionally, however, a positive blood culture will aid in arriving at a diagnosis of the true infectious nature of the illness even when roentgenologic evidence is lacking.

Acute rheumatic fever in its early stages may simulate either osteomyelitis or Ewing's tumor but a distinction should be comparatively easy owing to the flitting character of the joint involvement, the very characteristic response of the joint pain to the administration of sodium salicylate and the lack of roentgenologic signs in the former condition.

If the patient is a youth who complains of persistent or recurrent attacks of pain in the course of a long bone, particularly if the pain is worse at night, we must not be satisfied by a primary roentgenologic examination that results in negative findings. Repeated roentgenologic examinations should be made at regular intervals until the early destruction of bone and periosteal reaction are recognized or until a sufficient period has passed to render the presence of a new growth improbable. Only by frequent examinations at regular intervals can we hope to improve our average of early

diagnosis and perhaps also render the end results of treatment more hopeful. We must not forget that although the roentgenologic appearances may be characteristic in certain cases, they may confuse the issue in others. Figure 1 shows the radiologic characteristics of osteomyelitis of the femur, yet biopsy revealed the underlying process to be a Ewing's tumor.

Ewing's tumor begins in the endothelium of the blood vessels in the medulla of the bone and the bone becomes widened owing to invasion of the cortex, which becomes moth-eaten in appearance. A reaction of periosteal proliferation occurs with deposition of successive layers of new bone, as each in turn is destroyed by the advancing tumor process. It is this formation which gives to the roentgenograms the onion-layer-like appearance described in the literature. Although characteristic, this onion-layer-like appearance is not pathognomonic, for a similar reaction may occur in cases of osteomyelitis and, more rarely, in cases of osteogenic sarcoma.

When doubt exists as to the true nature of the lesion, a fresh frozen section should be examined microscopically. Microscopic diagnosis is one of the most certain methods for the identification of malignant lesions but it must be remembered that, on occasion, even a skilled surgical pathologist may have difficulty in arriving at a definite diagnosis. When this occurs, the surgeon must be certain that he has removed tumor tissue; it is advisable for the surgical pathologist to be present at the operation so that he may observe the site from which the specimens are taken. The surgical pathologist selects the tissue that is most likely to give a characteristic appearance microscopically. Not infrequently, at operation, a milky purulent-like material exudes as the tumor is incised and the surgeon concludes from this that he is dealing only with osteomyelitis. When this is associated with fever, leukocytosis and perhaps an indefinite microscopic appearance, it is easy for even an experienced surgeon to be misled unless he is on the lookout continually for just such an occurrence.

A confirmatory diagnosis, without recourse to surgery, may be obtained by means of therapeutic irradiation. Desjardins has maintained that the rapid melting away of these radiosensitive tumors under the influence of irradiation is an even more accurate test for Ewing's tumor than is

biopsy. We have observed several cases in which the pathologic diagnosis of inflammation proved to be erroneous and irradiation led to rapid destruction of the tumor.

In the treatment of Ewing's tumor, our methods of attack vary with the site of the tumor and the length of time that the condition has been present. The presence of metastatic lesions in the lungs precludes radical surgery in that it indicates an unfavorable prognosis. Roentgen therapy, however, can be used in an endeavor to relieve the pain from which these patients suffer. No doubt it was in cases such as these, in which the prognosis was poor if not completely hopeless, that irradiation had its first opportunity to challenge surgery, and the favorable results which followed in certain instances demonstrated the undoubted therapeutic value of this new method in our fight against malignancy. When irradiation therapy is used for tumors of the pelvic girdle, the patients should be forewarned of the possibility of a resultant sterility. Lead therapy has been used in cases in which the patients had a diagnosis of malignancy, but we have had insufficient experience with it to permit of our passing judgment as to its value in cases of Ewing's tumor.

Amputation because of tumor formation, unfortunately, is an admission of defeat; we admit our inability to destroy the growth successfully. When it is employed, it is done in the hope of obtaining a cure or as a palliative measure. There was a time when it was our tendency to treat the tumor by excision and irradiation, but at times the site or size of the tumor made even excision a hazardous undertaking. While the prognosis in cases of Ewing's tumor is almost uniformly bad when secondary tumor deposits are found in the lungs, the possibility of some benefit being derived from the use of Coley's toxins should be given due consideration. In "The diagnosis and treatment of Ewing's tumor" one of us (Meyerding) reported an interesting case. A girl, eleven years of age, had Ewing's tumor which had been diagnosed following microscopic examination, and for which treatment was by means of irradiation and Coley's toxins only. She is still alive about eleven years following the original treatment. The occurrence of what at this late date may be called a cure is an additional incentive to treat these patients conservatively rather than to submit them to mutilating operations.

Report of Cases

Case 1.—A boy, aged five years, registered December 19, 1923. He related that he had fallen from a horse eight months prior to this time, that there had been no disability as a result of the accident but that six months later he had begun to limp and to complain of pain in the region of the right hip. Four days prior to registration or approximately eight months following the injury, he had been awakened from sleep and since then had cried nightly because of pain.

On examination, complaint of pain was elicited on pressure over the greater trochanter of the right femur. The Wassermann blood reaction was negative, as was the Mantoux tuberculin test, but the von Pirquet test was reported as giving a questionable positive reaction. Leukocytes numbered 12,600 per cubic millimeter of blood; 7.5 per cent were eosinophils. The tonsils were enlarged. Roentgenologic examination of the thorax gave negative results; the lesion of the right femur was reported by the roentgenologist as osteomyelitis of the neck and of the greater trochanter (Fig. 1). It is of interest to note that the clinician who saw this patient also considered the condition to be osteomyelitis, whereas the consulting orthopedist thought that it might be tuberculous in nature.

At the time of operation, February, 1924, the surgeon was unable to determine the exact nature of the lesion from the gross appearance and he sent a portion of the tissue for microscopic diagnosis. The pathologist also deferred giving an immediate opinion until he had studied the microscopic appearance more thoroughly. Two days later a diagnosis of round-cell and oval-cell sarcoma was made by the surgical pathologist and the patient was sent for irradiation therapy. In April, 1924, further irradiation was given in the region of the groin and hip. The roentgenograms taken at this time, or two months postoperatively, were reported as showing osteitis of the neck and greater trochanter of the right femur. In May, 1924, the patient became very ill and the roentgenologic examination of the thorax revealed the presence of metastasis. Irradiation of the lungs was performed. The patient died two months later with metastasis to the skull and lungs. A re-examination of the tissue was made, in 1939, by Dr. Broders, who reported hemangio-endothelioma, grade 4 (Ewing's tumor).

Case 2.—A boy, aged twelve years, was admitted at the clinic on October 28, 1930, with a history of pain in the region of the right hip of five months' duration, which became associated with a limp two months later. He stated that the pain was dull and aching in character and that it occurred periodically, sometimes in the hip and at other times in the thigh and knee. Between the attacks of pain, he was completely free of symptoms. Damp weather aggravated his pain and at times his temperature had been 102° F. (38.8° C.). Interrogation elicited the fact that one month prior to the onset of the pain, or six months prior to his admission, he had fallen with the thigh in an abducted position and had suffered severely at that time, although recovery occurred within a few days. The father

stated that prior to coming to the clinic a diagnosis of tuberculous osteomyelitis had been made.

Examination revealed a fullness over the proximal anterior aspect of the right femur and the veins in this region were engorged. Fluctuation could be de-

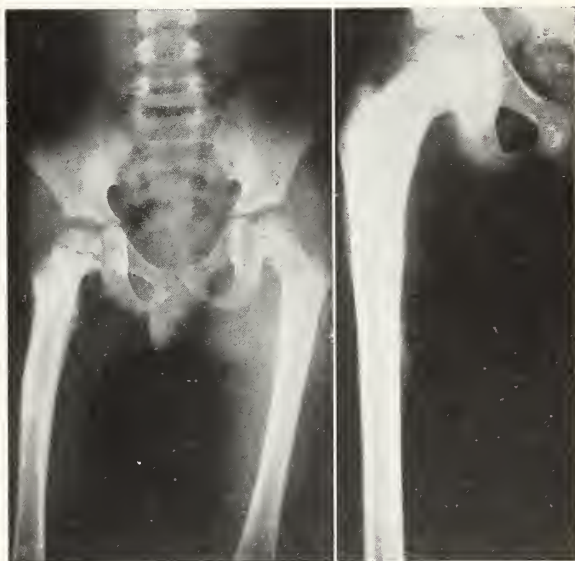


Fig. 1. (left) Anteroposterior view demonstrating Ewing's tumor of right femur which had been roentgenologically diagnosed as osteomyelitis. The clinical diagnosis was osteomyelitis and the microscopic diagnosis was round-cell and oval-cell sarcoma.

Fig. 2. (right) Ewing's tumor of the portion of the upper right femur. Note the periosteal thickening and masking of the medullary cavity with moth-eaten appearance.

tected and a diminution in the range of movement was noted. The tonsils were injected. The Wassermann blood reaction was negative. The leukocytes numbered 4,800 per cubic millimeter of blood. A roentgenologic diagnosis of Ewing's tumor was made and as the roentgenograms of the thorax were normal, operation was advised for microscopic confirmation of the clinical and roentgenologic opinions (Fig. 2). On October 31, 1930, a biopsy was performed and a fresh frozen section was studied. A diagnosis of Ewing's tumor was made. Irradiation was carried out in November and December, 1930, and in February and April, 1931. In February, 1931, the limp and swelling had practically disappeared and the thickened periosteum, evidence of which had been obtained previously on roentgenologic examination, had almost disappeared. In April, 1931, because of a suspicion of early metastasis, irradiation therapy was given over the region of the thorax. Clinically, however, the child was healthy. His leg moved normally, the circumferences of both thighs were alike and the roentgenograms of the femur were reported normal. His weight at this time was 83 pounds (37.7 kg.).

In August, 1931, the roentgenograms of the thorax and femur, taken elsewhere, were sent to us for an opinion; both were normal. In March, 1938, the patient reported by letter that he was in good health, which was almost eight years following the onset of symptoms.

Case 3.—A male student, aged eighteen years, registered at the clinic on July 28, 1934. He related a history of an injury, which had occurred while playing with friends about four months prior to registration, since which time he had noticed an intermittent, dull,

through 36 mm. of aluminum. Following treatment there was rapid improvement in symptoms and destruction of the tumor.

This patient has been under our observation for a period of five years and has remained well, has car-



Fig. 3. The left humerus; *a*, four months following injury and before treatment; lamination (onion-layer appearance), thickening of the periosteum and masking of the medullary cavity are evident. A diagnosis of Ewing's tumor was made; *b*, following irradiation, marked improvement is apparent.

aching pain in the shaft of the left humerus which caused no particular discomfort until six weeks prior to admission. At that time he said that the pain had become more noticeable and he was able to palpate a fusiform mass in the shaft of the humerus and that during the month prior to coming here, he had had a temperature as high as 100° F. (37.7° C.) with occasional sharp flashes of pain projecting down the arm, increase in the size of the swelling and some loss of weight.

Examination revealed a well developed and well nourished young man, whose height was 5 feet 11 inches (177.5 cm.) and whose weight was 165 pounds (75 kg.), and whose blood pressure, pulse rate and temperature were all within normal limits. There was a fusiform mass that involved the shaft of the left humerus which was tender and at which point there was apparently some fluctuation. The circumference of the upper portion of the left arm was 1.5 inches (3.8 cm.) greater than that of the right. Palpation disclosed increased temperature over the region of the tumor. The roentgenograms of the thorax were normal. The urine and blood were normal and a flocculation test on the blood for syphilis gave negative results. A clinical and roentgenologic diagnosis of Ewing's sarcoma (Fig. 3) was made and the patient was referred to the Section on Radiotherapy for irradiation. He received four courses of treatment, over a period of two years, of moderate voltage technic with 135 peak filtered



Fig. 4. Anteroposterior view demonstrating Ewing's tumor of the right femur with lamination sun-ray-like appearance, thickening of the bone and masking of the medullary cavity. On two occasions the patient had been operated on for osteomyelitis.

ried on his work and has had no evidence of local recurrence of the tumor or of metastasis.

Case 4.—A boy, aged five years, was brought to the clinic on August 27, 1934. There was a history of pain in the right thigh of ten months' duration. Three months prior to the onset of the pain the child had fallen from a tricycle and had bruised the upper portion of the right thigh. The pain had been intermittent and was principally present at night accompanied by a temperature of 99° F. (37.2° C.), malaise and marked anorexia. Roentgenograms had been taken and had been reported negative. On two occasions prior to his registration, the patient had been operated on and a diagnosis of staphylococcal osteomyelitis had been made; the wounds had been Dakinized on these occasions. The symptoms recurred following each operation, however, and the wounds had healed rapidly.

Examination at the clinic disclosed enlargement of the upper part of the right thigh; locally the part was hot and the patient had a temperature of 100° F. (37.8° C.). The roentgenologist suggested the diagnosis of Ewing's tumor possibly with a fracture (Fig. 4). Roentgenologic examination of the thorax gave negative results. The urine was normal. The blood contained 10.3 gm. of hemoglobin per 100 c.c. and the leukocytes numbered 10,600 per cubic millimeter. The various forms of treatment of this condition, consisting of amputation, irradiation and biopsy, were thoroughly discussed with the father. It was decided that he would return home to the care of his attending

physician. A biopsy was then performed by his attending physician at home and the tissue was submitted to Dr. Ewing for examination. He gave the following report: "The tissue from the femur which you sent me shows a process which it is difficult to interpret, but which I think we must regard as a malignant tumor. There is hardly enough tissue to decide between some form of myeloma and endothelioma, but it is certainly one or the other. In young children I have repeatedly seen cases which proved to be endothelioma, but which were accompanied by much osteomyelitis, and I think this is one of those. Yet, I am not entirely certain that it is not myeloma, complicating chronic osteomyelitis.

"In any case, it is a malignant tumor, and should be treated as such, with fair doses of x-ray of moderate degree, about 300 R, frequently repeated over wide portals and over a long period. In any case I fear the outlook is unfavorable, but not hopeless. I would be interested to know the outcome of the case."

The patient received, elsewhere, four courses of irradiation treatment during October and December, 1934, and February, 1935, and appeared to improve until about two and a half months prior to his second visit to the clinic.

The boy again registered at the clinic in July, 1935. The history revealed that he had been well until about ten weeks previously. However, at that time, pain had recurred in the thigh and was accompanied by a temperature ranging from 100 to 102° F. (37.8 to 38.9° C.), a loss of weight and malaise. Recent roentgenograms of the body has been reported as normal, but there had been an increase in the number of leukocytes to 14,000 per cubic millimeter. Examination revealed marked improvement in the condition of the right femur from the roentgenologic standpoint. The periosteal changes in the bone had disappeared and there was a sclerotic appearance of the upper portion. The child had fallen from a wagon and there appeared to be a fracture through the trochanteric region of the femur. The temperature was 100° F. (37.8° C.) at this time. The roentgenograms of the thorax did not show evidence of metastasis.

Death occurred as a result of multiple metastatic lesions on December 3, 1935, sixteen months from the time of admission at the clinic and twenty-six months following the onset of symptoms.

Case 5.—A student, aged twenty-three years, registered at the clinic on November 1, 1920, because of pain and swelling in the right shoulder. He gave a history of injury to the shoulder while playing football two years prior to registration; a year later, he had noticed pain and stiffness on exercise and eight months prior to admission he fell on the shoulder while playing basketball. Following the latter injury his shoulder was very painful, sore and stiff and the roentgenograms revealed evidence of a fracture and tumor, possibly sarcoma, at the site of fracture. Operation had been considered, even forequarter amputation, by the physicians consulted. Dull pain continued in the upper portion of the arm with extension of the pain

to the hand and there was an associated stiffness and weakness.

The patient was 5 feet, 7 inches (167.5 cm.) in height and weighed 173 pounds (78.6 kg.) which was about his normal weight. The blood pressure was 140

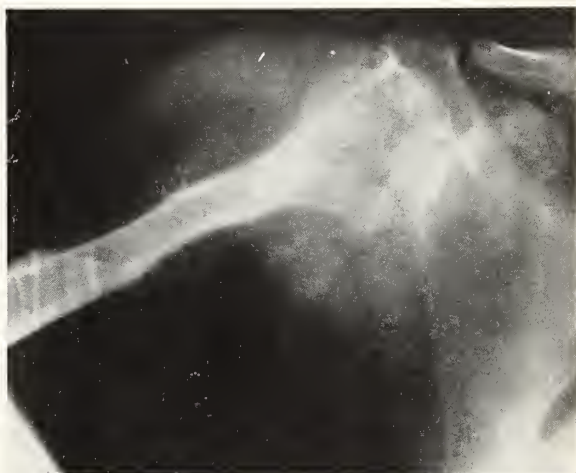


Fig. 5. Anteroposterior view taken with the arm externally rotated, showing absorption of the upper portion of the humerus resulting from Ewing's tumor. The tumor eventually invaded the soft tissue.

mm. of mercury, systolic, and 72, diastolic. The pulse rate was 76 per minute and the temperature 99° F. (37.2° C.). The right shoulder was slightly larger than the left and slightly tender. The arm could be abducted 95 degrees and other motions were good. A pilonidal cyst was present; the region was tender, hot and there was an opening through which pus was discharging. Roentgenologic examination revealed evidence of a tumor of the upper third of the right humerus with involvement of the soft tissue and a diagnosis of sarcoma was made (Fig. 5). Roentgenologic examination of the thorax gave negative results.

Various methods of treatment were discussed and on December 3, 1920, an excision of the tumor was done, and the wound was packed to control hemorrhage; the patient was advised at this time that ultimately amputation might be necessary. The pathologist made a diagnosis of medium round-cell sarcoma. The patient coöperated well and reported at regular intervals for observation. He gained weight rapidly. Dermatitis developed around the wound, the result of the irritating discharge and irradiation; this, however, was not serious.

Following exploratory operation for the tumor of the upper third of the right humerus December 3, 1920, radium was applied four times into the wound at different levels from December 9 to 21; a 50 mg. tube was used for fourteen hours at each application. This was followed by checkerboarding the entire right arm and upper part of the thorax into twelve areas. At a distance of 2.5 cm. from the skin, 50 mg. of radium was applied for fourteen hours over each area from December 24 to 29. The same principle of external treatment was applied February 5 to 11, 1921, using seventeen areas; a 50 mg. tube was applied for twenty

hours to each area. In April, 1921, a similar series of treatments was carried out over eighteen areas around the upper portion of the right arm and shoulder; 50 mg. of radium was applied for twenty hours to each area. Also, a similar series was carried out in July, 1921, and in September, 1921. Each of these series aggregated a total of slightly more than 10,000 milligram hours. In February, 1922, a 50 mg. tube of radium was inserted into a sinus in the right arm for a dosage of 400 milligram hours and on March 28, 1922, a 50 mg. tube was inserted into the sinus for a dosage of 700 milligram hours. On May 11, 1922, a 50 mg. tube of radium was inserted into the sinus in the right arm for a total of 800 milligram hours.

On February 7, 1921, roentgen rays were directed toward the right supraclavicular and infraclavicular regions through three anterior fields, one above the right clavicle and one below that clavicle and additional treatment was given through one posterior field in the scapular region. Each of these fields was exposed to roentgen rays generated at 135 kv., filtered through 4 mm. of aluminum, and was given at 6 milliamperes for eight minutes, at a focal-skin distance of 12 inches (30 cm.). On April 4, 5, and 7, 1921, a second course of treatment was given through two supraclavicular fields, one on each side, and through five anterior thoracic fields, three extending transversely from the right shoulder to the left shoulder and two perimedial fields below this down to the level of the ensiform cartilage. Additional treatment was given through four posterior fields, two on each side of the spine extending from the upper border of the scapulas down to the level of the eleventh thoracic vertebra. Each of these fields was exposed to roentgen rays generated at 135 kv., filtered through 6 mm. of aluminum, at a focal-skin distance of 12 inches (30 cm.), and each received at 6 milliamperes for eleven minutes. On April 28 and 29, 1921, a third course of treatment was given through two supraclavicular fields, one on each side of the median line, two upper thoracic fields, one on each side the midsternal line, two to the lateral aspect of the right arm extending from the point of the shoulder downward, and two posterior fields, one through each scapular region. Each of these fields was exposed to roentgen rays generated at 135 kv., filtered through 6 mm. of aluminum at a focal-skin distance of 12 inches (30 cm.) and received at 6 milliamperes for twelve minutes. On May 25, 1921, a fourth course of treatment was given through three fields, one right supraclavicular, one right infraclaviculo-axillary and one posterior scapular field. Each field was again exposed to roentgen rays generated at 135 kv., filtered through 6 mm. of aluminum, at a focal-skin distance of 12 inches (30 cm.) and received at 6 milliamperes for twelve minutes. On July 6, a fifth course of treatment was given through three fields similar to those used for treatment on May 25. The technical factors of treatment were precisely the same. A sixth course of treatment, similar to the last two, was given on September 7, 1921. On December 6, 7 and 8, a seventh course of treatment was given through two supraclavicular fields, one on each side of the median

line, and two anterior thoracic fields extending from the clavicle to the ensiform cartilage, and from the median line laterally to include the anterior aspect of the axilla on each side. Besides this, each axilla received separate treatment. Each of these fields was exposed to rays generated at 90 kv., filtered through 0.5 mm. copper plus 1 mm. of aluminum, at a focal-skin distance of 12 inches (30 cm.), and received at 5 milliamperes for thirty minutes. On September 13, 14, and 15, 1923, another course of roentgen therapy was given through one large right anterior thoracic field, extending from the upper border of the clavicle to the inferior border of the fifth rib in the mid-clavicular line and laterally from the midsternal line to include the anterior aspect of the axilla. A second lateral field was directed through the upper part of the right arm and a third large posterior field extended from the left midclavicular line to include the mediastinum, the region of the scapula and the posterior aspect of the right axilla. The anterior and posterior fields measured 20 by 20 cm., and the lateral field through the right arm measured 10 by 10 cm. Each of these fields was exposed to roentgen rays generated at 180 kv., filtered through 0.75 mm. of copper plus 2 mm. of aluminum, at a focal-skin distance of 50 cm. (20 inches), and received at 4 milliamperes for seventy-five minutes. On November 28 and 30 and on December 1 and 3, 1923, another course of roentgen therapy was given through two large anterior thoracic fields and two corresponding posterior thoracic fields. These extended from the upper border of the clavicle to the ensiform cartilage and from the midsternal to the midspinal line, to and including the anterior and posterior aspects of the axilla. Each of these four fields was exposed to roentgen rays generated at 200 kv., filtered through 0.75 mm. of copper and 2 mm. of aluminum, at a focal-skin distance of 50 cm. (20 inches), and received at 5 milliamperes for eighty minutes.

The patient was examined at the clinic on August 2, 1922, when a sequestrum was removed from the right humerus. He returned on May 15, 1923, or two and a half years following the original operation. The sinus had increased in size and there was a pathologic fracture of the right humerus; a section of the deltoid muscle and bone was removed; the latter apparently was necrotic. The pathologic examination revealed a mixed-cell sarcoma.

On August 20, 1923, the patient was again seen and an ununited pathologic fracture and ulceration were found. The tumor had invaded the muscle. This region was removed and the patient requested that disarticulation of the arm be performed, although he did not wish to have a forequarter amputation. Disarticulation of the arm with complete removal of the deltoid muscle was performed on August 22, 1923.

The patient again reported in November, 1923, when he had gained in weight, looked well and there was no evidence of metastasis. He was seen in September, 1924; the wounds had remained healed, there was no evidence of metastasis and he had gained further weight. In February, 1925, he reported for observation and had

gained yet more weight, the wounds had remained healed and there was no evidence of metastasis. He was last seen in 1933, when he weighed 212 pounds, looked healthy and was working. He reported at intervals from then on and was last heard from in November, 1939, when he stated that he was in the best of health, that the shoulder had given him no trouble, that he had gained more weight and that he was carrying on his usual occupation.

Summary

In reviewing the features common to Ewing's tumor and osteomyelitis we wish to indicate the necessity for careful study of the clinical, roentgenologic and microscopic findings in order that an accurate diagnosis may be reached without loss of time.

Ewing's tumor may simulate a minor affection

so closely that even those skilled in diagnosis may be deceived. On occasions, it would appear that one condition had become engrafted on the other; yet, even when this occurs, we feel that a careful investigation will reveal almost invariably the more serious nature of the disease process.

With earlier recognition and comprehensive treatment by means of surgery, irradiation and Coley's toxins, the mortality rate in cases of Ewing's tumor has been greatly reduced and we are now able to give a more favorable prognosis.²

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RAT MITE DERMATITIS IN MINNESOTA

WILLIAM A. RILEY

University of Minnesota

Minneapolis, Minnesota

THE fact that the so-called Tropical Rat Mite, *Liponyssus bacoti*, will readily attack man and that it is often the cause of an irritating dermatitis has long been known. Cases have been reported particularly for Egypt, Abyssinia, Australia and Argentina.

In 1923, Bishopp reported that it had recently attracted attention in Texas, and, in one instance, in Mississippi, as an annoyance of man. Since then, there have been a number of records of the mite occurring in various parts of the South. McIntosh reports it as attacking employees in stock yards in the St. Louis area.* It has also been taken in New York City and Boston. These last records from seaport towns might readily be explained on the basis of accidental importation, and have not served to alter the general opinion that the mite is, as its common name implies, a tropical or subtropical species.

Over a decade ago there was brought to the attention of the writer, a case in which the offices of a Minneapolis company were invaded by hordes of small red mites shortly following fumiga-

tion to kill rats and mice in the building. The mites were determined as *Liponyssus bacoti* but the fact that the presence of mammalian red blood corpuscles in them was readily demonstrated, did not serve to shake the belief of the exterminator that they came from the samples of wheat in the laboratories.

A second case was that of a Saint Paul apartment house where the tenants complained bitterly about the attacks of the mites. The house was rat infested and was near a dump which harbored many rats.

In late January of the present year a physician from Pipestone, Minnesota, submitted to the State Department of Health specimens of the same species which were annoying employees of a local department store and causing "peculiar itching macular skin eruptions." Very shortly thereafter a similar complaint accompanied by specimens, came from Blue Earth, Minnesota, and there have been several other instances in which it seemed highly probable that mites of this species were causing trouble, although specimens were not found. It is evident that this troublesome parasite is not limited to the South or to tropical countries and physicians anywhere

*While this article was in the hands of the printer, Dr. L. F. Weber reported (*Jour. A.M.A.*, April 13, 1940, p. 1442) five cases of rat mite dermatitis among employees of a Chicago department store.

in this country may encounter puzzling cases of dermatitis due to its attacks.

In general, the severe cases are more likely to be those of children, although they are by no means limited to such. Dr. B. Shelmire of Dallas, Texas, was the first American worker to publish careful studies of the clinical aspects. His attention was attracted to the problem in 1928, when three members of a Dallas, Texas, family consulted him regarding a skin eruption diagnosed by a local physician as scabies. In their report, in 1931, Shelmire and Dove state that since these first cases, as many as 200 additional ones had been brought to their attention. In the case of adults they found the eruption to consist of small urticarial wheals and papules varying in size from that of a pinhead to that of a split pea. On young children they were in the form of papules, urticarial welts and, often, frank vesicles which were not confined to the hands and feet but diffusely distributed. In some instances the eruption simulated chicken pox.

On epidemiological grounds, followed by laboratory experiments, these workers concluded that *Liponyssus bacoti* was a carrier of endemic typhus from rat to rat and to man (Dove and Shelmire, 1931, 1932). Although this work is often overlooked, because of the present-day emphasis on the rôle of rat fleas, it was so carefully carried out that there can be no doubt that the mite is a potential vector.

In superficial appearance, *Liponyssus bacoti* resembles the common red mite of poultry. The failure to find the mites when they are present is not surprising, in view of the fact that the fully fed female does not exceed a twenty-fifth of an inch in length and the male is little more than half that size. The newly hatched young are much smaller. In all stages they attack man or their rodent hosts and after a brief period of feeding they drop off and hide in cracks and crevices where they molt and are again ready for a meal.

The presence of this mite in Minnesota is another of the many reasons for more active efforts to exterminate its vicious rodent host. Only through reduction of the rat and mouse populations can the mite be eliminated. Under some conditions fumigation with hydrocyanic acid gas will prove effective in eliminating both rodents and their parasites from buildings, but the hazards of such treatments are too great to justify its use by inexperienced persons.

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KNOWLEDGE OF DISEASE

Knowledge of disease has now advanced so far that it is very often desirable to treat the patient before he knows that he is sick. People stricken with acute disease hasten to their doctor for aid. Those suffering from a chronic disease of insidious onset tend to put off their visit to a doctor and to seek relief by self treatment. Yet we know that, in many diseases, the best hope for cure depends on early treatment; treatment even before the symptoms appear. This is not only true of tuberculosis but of several other diseases including the two at the top of the list of causes of death: cancer and heart disease. It is true of diabetes, of many cases of syphilis, and of certain kidney diseases which though so slight as to be overlooked may cause high blood pressure later on. An attempt has been made by the American Medical Association to adjust the private practice of medicine to this situation but periodic medical examinations have not been widely accepted.—J. ROSSLYN EARP, M.D., *Health News*, May, 1940.

HISTORY OF MEDICINE IN WINONA COUNTY

(Continued from May issue)

Biographies

It has proved impossible to work the lives of all the Winona physicians, between 1850 and 1900, into the text of this essay. A biographical dictionary seemed to be a solution.

All available material concerning Winona physicians up to 1885 has been used and for those who practiced after 1885 brief sketches only have been given. Those about whom very little is known have been listed in order to give an idea of the approximate number of men who practiced in the county. In many cases, men referred to as "doctor," or even listed as physicians in the directories, were dentists, druggists, veterinaries, or quacks. No biographies of physicians now living in Winona County are given.

Rudolph Alberti came to Winona City in 1871. He was popular among the Germans there, and had quite an extensive practice. The reason for his departure in 1874 is unknown. The *Chicago Times* referred to Dr. R. Alberti as being involved in a questionable case in Davenport, Iowa, in 1869. He practiced in Saint Paul at some time previous to his stay in Winona (See Ramsey County).

Dr. Allen came to Winona as a practicing physician in the fall of 1853. According to Dr. D. B. Pritchard, Allen was the first man to practice medicine in Winona County. Little is known of him. He remained until the spring of 1854, and then moved to Chatfield.

E. H. Allen lived in Winona about 1880, and was gone by March, 1882. Apparently he graduated from the Medical Department of the University of Pennsylvania. He may have moved to Freeport, Illinois.

J. R. Andrews came from New York City and died in Winona City in June, 1870, at the age of fifty-two. He came in hope of improving his health, but lived only a few weeks after his arrival. He was president of the New York Medical College for Women at the time of his death.

Isaac Watwood made use of magnetic cures. In 1875-1878 he had a Turkish bath establishment. He contemplated opening a Turkish bath institute at Rochester in March, 1877. In August, 1878, he was still a resident of Winona City, and at that time he agreed to occupy a building and install Turkish baths at Arcadia for two years.

Henry N. Avery, A.M., M.D., came to Winona City in July, 1873, from New York, with the intention of locating there permanently. He was the son of Professor Charles Avery of Hamilton College, New York. Dr. Avery had been professor of physiology and clinical lecturer in diseases of the

throat and lungs in the Homeopathic Medical College of New York. He was, at the time of his arrival, a member of the State Board of Medical Censors of the State of New York. He brought with him to Winona recommendations from the Hon. Hiram Barney, a former collector of the port of New York, Professor Theodore W. Dwight of Columbia College, Hon. Roscoe Conkling, and others. His card published in August, 1873, read:

HENRY N. AVERY, M.D.

Homeopathic Physician and Surgeon

Special attention given to Diseases of the Throat
and Lungs, also to Chronic Diseases of all forms.
Office—4th street between Washington and Johnson.
Hours—8 to 10 A. M.—2 to 3 P. M.
6 to 8 P. M.

When in May, 1877, he moved to Galesville, the Winona paper said, "The people of Galesville will find in him a public spirited and cultivated member of the profession." In the spring of 1882, he moved with his family from Galesville to Minneapolis.

L. A. Babcock opened an office and started practice in Winona about 1859 and remained until about 1862.

John L. Balcombe came to Winona early in 1852 on an exploring trip. He returned the next year, built a farm house on a claim and lived there until his death, September 24, 1856. He did not make a business of medicine. Dr. Balcombe was a highly respected and influential citizen.

J. W. (or J. G.) Baldwin practiced in Lewiston from about 1873 until 1890 or later.

Dr. Baldwin testified in a court case at Utica in January, 1882. He may have practiced there. Probably he was from Plainview, Wabasha County.

G. W. Barck, physician and surgeon, opened an office and started practice in 1860. He was gone in 1866.

O. F. Bardwell lived in Winona in 1866. He moved to Wisconsin, then returned again to Winona in March, 1883, with his family. He was listed in that year as a pile specialist.

S. R. Beckwith practiced at Winona in 1865.

Charles Benson, M.D., physician and surgeon, came to Winona in 1857. He had a drug store for a time and in 1861 had a book store. Drs. Benson and Bunson appear to be confused in several reports.

J. W. Bentley lived at Minnesota City during the winter of 1852-1853. Then he made his permanent residence at the town of Utica, where he became postmaster and justice of the peace. In the years 1859 and 1862 he was listed as a clerk in Utica township.

D. W. Bingham was listed as a Winona physician in 1865 (possibly meant to be Dr. R. H. Bingham).

R. H. Bingham was referred to in September, 1856, as a candidate for county treasurer. He served three years during the Civil War as surgeon of

the 9th Minnesota Regiment, and returned to Winona in 1865. Dr. Bingham moved from Winona to Chicago. When he returned on a visit in 1879, he was referred to as "an old time resident but for many years past of Chicago."

E. C. Blodget was listed among Winona physicians in 1864.

A. W. Blunt, M.D., homeopathic physician and surgeon, was a resident of Winona in 1866. He left and again returned to Winona in 1879, intending to make it his permanent home. Dr. Blunt was son of the chief engineer of the Winona and Saint Peter Railroad. He was a graduate of the Chicago Homeopathic College and for some time previous to 1879 had been in charge of the Central Homeopathic Dispensary and Hospital. He came with fine recommendations and associated himself with Dr. T. A. Pierce. At this time his card appeared in the *Winona Republican*. He moved to Saint Charles in March, 1880, and in May of the following year was called to Clinton, Iowa, to take the place of a former classmate who had been killed in a railroad accident. Dr. Blunt was well liked in Winona.

A. C. Boyd came from Mazeppa and took up his residence at Lewiston in August, 1881. Dr. Boyd graduated from Rush Medical College in 1881. In 1885 he became a member of the Winona County Medical Society. In March of that year, he is recorded as engaged in the drug business.

Sheldon Brooks was born in Redfield, Oswego County, New York, on May 20, 1811. He lived there until his health compelled him to come to Minnesota, and he located at Beaver in 1856. He at once took an active interest in the development of the territory. He served as one of the county commissioners under the territorial organization, and after the state was admitted became a member of the legislature (1860-1861). In 1862 he built a grain warehouse at Minneiska and moved there, engaging in the grain business until May, 1874, when he retired and moved to Winona. He was a man of integrity; was very successful in business and was held in high esteem by all who knew him. Dr. Brooks died in Winona of progressive paralysis on May 19, 1883.

Bradley Bunnell located at Homer in the early 1850's and died there on June 9, 1857, aged seventy-five years. By his kindness and skill as a practitioner, he gained many friends in the community. Dr. Bunnell probably came to Winona County from Buffalo, New York.

Lafayette Houghton Bunnell arrived at the present site of Winona in 1844. However, he did not take up his residence in Winona County until some years later. No definite report of his residence in the county is found until 1871, when he was a settler of Homer. He was the son of Dr. B. Bunnell. During the interval between 1844 and his settling at Homer, he was probably living at La Crosse. Dr. Bunnell was the author of the "Discovery of the Yosemite," and of a series of historical sketches of Winona. He had much to do with the first Winona County history, published in 1883. He also wrote a record of his life among the Indians since 1844. Dr. Bunnell was born in Rochester, New York, in 1824, and died in Winona in July, 1903. He is recorded as having served in the Mexican War. There is no indication of his having practiced his profession while in Winona County.

Charles Bunson's card, which appeared in the Winona paper in August, 1876, read as follows:

DR. BUNSON

Physician, Surgeon and Accoucheur

Consultations in German, French and English.

Office—Second Street over Hollingworth's store.

Residence—Center Street

Dr. Bunson remained in Winona until April, 1882, when he moved to Galesville, Wisconsin.

H. V. Burnett was recorded as a physician of Winona County in 1865.

J. W. Burns settled in Utica with his family in January, 1878. Dr. Burns was considered to be a skillful physician and surgeon. He came to Winona County from Wisconsin.

John A. Burt, a homeopathic physician, graduated from the Hahnemann College, Chicago, in 1867. In 1885 he was practicing in Saint Charles.

E. V. Casteneg was listed as a physician of Winona County in 1865.

William A. Chamberlain graduated from Rush Medical College in 1882. He located at Saint Charles, Winona County, in February of that same year. In January, 1883, he purchased a stock of drugs. Then ten months later, he came to Winona to engage in the drug business. He continued his store in Saint Charles under a manager and introduced Dr. Knapp of Maine as a successor to his practice there. Early in the year 1883 Dr. Chamberlain was elected a member of the Winona County Medical Society.

Arthur Chambers came to Winona City in 1855. He advertised wholesale and retail drugs soon after his arrival. On December 18, 1855, his physician's card appeared in the Winona paper reading thus:

DR. A. CHAMBERS

Operative Surgeon

Office at his residence, corner Third and LaFayette streets, Winona, M. T.

Dr. Chambers' ample opportunity and experience as a Surgeon for several years in the East is a sufficient guarantee of his ability and success.

Operations and advice to the poor, FREE OF CHARGE, every Saturday, at his office.

In November, 1860, the following notice appeared:

A. CHAMBERS

Attorney and Counselor at Law

and

Dealer in Real Estate

George F. Childs was a member of the pioneer squad of the Western Farm and Village Association. He came to the present site of Winona from New York in May, 1852, and took a claim, upon which he lived for several years. He was a botanic physician but never practiced his profession in this vicinity, or did so only to a very limited extent. He engaged in mercantile business for a year or two after he sold his land. In the fall of 1855 he was elected a trustee of the First Baptist Church in Winona. In 1857 he moved up-river to Minneiska, Wabasha County. There he remained for some time, but later returned east. In 1883 he is recorded to have been in charge of a benevolent institution, a home for aged people, in Maryland.

Coleman N. Clark graduated from the University of Buffalo in 1865. The next year he came to Winona County and located at Saratoga. Dr. Clark was a charter member of the Winona County Medical Society organized in 1869. In 1881 he served a year as president of the society. At that time he lived in Saint Charles, having moved there about 1878. He became a member of the Minnesota State Medical Society in 1882. He was health officer of Saint Charles in 1885-1886.

Elisha Fessenden Clark was born in Conway, Massachusetts, in 1804. He had his academic and medical education at Deerfield, Massachusetts. He first practiced his profession in the lake regions of central and southern New York. In 1834 he went to Mississippi, where he had an extensive practice, but the malarious climate seriously impaired his health and he moved to Iowa in 1849. He came to Winona in 1856, and resided in the city until his death in February, 1879.

James B. Cole, son of Dr. J. M. Cole, graduated from the University of Michigan in 1882. He took up practice in Minneiska soon after receiving his degree. In 1883, he became a member of the Winona County Medical Society, and during the same year he was elected to membership in the State Medical Society.

James M. Cole came to Winona in June, 1854. He was the first practicing physician in Winona and remained more than four decades, up to the time of his death. Dr. Cole was born at Fayetteville, New York, February 4, 1824. He read medicine with Dr. Horace Seamon of Millport, New York, attended lectures in the Geneva Medical College and finished his medical education in 1846. Later, he practiced under the exemption law.

Upon his arrival from New York State in 1854, the following card appeared in the Winona paper:

DR. J. M. COLE
Physician and Surgeon
Office—Corner Third and Johnson Street
Winona, M.T.

In May, 1856, Dr. Cole and Dr. S. B. Sheardown became office partners, an arrangement which was discontinued in June of the following year. It was at that time that many physicians were forced by the depression to engage in other pursuits for a living. An urgent request to "pay up accounts" to Cole and Sheardown was entered in the paper, and immediately thereafter Dr. Cole opened a livery stable. In 1861, he again took up the practice of his profession. The following notice and card appeared at that time:

The attention of persons in need of medical attendance is directed to the card of Dr. J. M. Cole elsewhere. He is a pioneer of this place, and in an extended practice and strict attention to his profession has been enabled to learn the peculiarities of this climate and the wants of the invalids. Volunteers' families will find his name recorded among physicians who offer gratuitous service.

J. M. COLE
Physician and Surgeon
Office—at resident near Huff's Hotel
Will promptly attend to calls either day or night.

Dr. Cole served in many municipal offices. He served on the local Board of Health in 1866. In 1869, he was appointed to furnish medical attendance to the poor at the county poor farm. In 1873, he was elected city physician, being the first to hold this office. He continued to serve in that capacity in 1874, 1875 and 1876. During the years 1874 and 1875, he was county physician. It is of interest to notice that the office then paid \$600 a year. Dr. Cole was one of the organizers of the Winona Preparatory Medical School and was an instructor there. He served as school director or as a member of the school board in Winona continuously from 1875 until 1883. In 1883 he was president of the school board. Dr. Cole was a charter member of the Winona County Medical Society. In 1871 and again in 1882 he was president of that organization. He became a member of the Minnesota State Medical Society in 1870. In 1882, he attended the meeting of the American Medical Association in Saint Paul as a representative of the Winona County Medical Society.

Dr. Cole was an active Mason and Odd Fellow. He took an active part in the Democratic county conventions, and in 1877 he became a member of the State Legislature. He was chairman of the Board of Directors for the North-Western Fair held in August, 1876.

When the "Winona County History" was compiled in 1883, Dr. Cole gave assistance and supervision.

J. R. Cone arrived in Winona City in May, 1856. His card appeared in the *Winona Republican* on the 20th and read as follows:

J. R. CONE

Physician and Surgeon

Office—on 2nd street, over R. D. Cone's store.

Would respectfully offer his services to the citizens of Winona and vicinity in the above capacity. A share of public patronage is solicited.

In October, 1859, when he was running for county treasurer, the newspaper defended him against slanderous reports circulated by the Democrats. Dr. Cone died in Winona in April, 1863, of pulmonary consumption. He was forty years of age at the time of his death.

C. H. Connelly may have practiced in Winona County in 1858 (see Goodhue County).

D. M. Cool may have practiced in Winona County in 1865.

Dr. Corkins was in Winona City in 1875 and may have practiced there.

J. C. Crandall practiced medicine at Witoka in 1880. He was a homeopathic physician and not having graduated from a medical school, he practiced under the exemption law.

E. N. Cushing was listed as a practicing physician in Winona County in 1865.

C. B. Dayton, M.D., physician and surgeon, put his card before the public of Winona City in June, 1857. In 1859 he became the partner of Dr. D. C. Patterson. Dayton left Winona about 1861.

Dr. Dixon of Saratoga, Winona County, received the appointment of surgeon to the Fifth Minnesota Regiment in July, 1863, and started for

Vicksburg immediately. Prior to that date, he probably practiced in Saratoga.

H. W. Driver was listed as a physician in Winona County in 1865.

M. N. Dyer was listed as a physician in Winona County in 1864.

W. C. Edmund was mentioned as a physician in Winona in 1859.

William I. English was born in Wisconsin in 1864 and was educated at the University of that state. He graduated from the College of Physicians and Surgeons of Chicago in 1886. He practiced medicine at Arcadia, Wisconsin, for four years and in 1891 came to Winona, where he was associated with Dr. Stewart. He died in Winona in February, 1899, after a short illness, from pneumonia.

D. C. Estes was mentioned as a Winona physician in 1859, and again in 1866.

W. M. Evans was born, raised, and studied medicine in Winona. He practiced in Granite Falls in 1881.

O. M. Farrington came to Winona in 1855. His card, published in October, read:

DR. O. M. FARRINGTON

Physician and Surgeon

Office—corner of Main and Third Sts., Winona,
Minnesota

Dr. Farrington is prepared to attend to all calls within the village or country, and hopes by strict attention to the duties of his profession, to merit and receive a share of patronage.

N. B. Particular attention paid to diseases of the Eye.

In the spring of 1857, when few of the medical fraternity could make both ends meet, Dr. Farrington started a hardware establishment. In 1867 and 1868 he served on the Board of Education. He continued in the hardware business until 1876, at which time he and W. S. Farrington opened a drug store. He sold out his drug business in February, 1879, and went to New York, where he studied in a hospital for a time. In May, 1880, he took up his profession in Huron, Dakota Territory, and he died there in September, 1881.

A. S. Ferris, M.D., came to Winona City in May, 1856, and opened a store at the corner of Center and Levee Streets with a large assortment of drugs, paints, and oils. In September of that year, he published the following card:

A. S. FERRIS, M.D.

Office

Corner of Center and Front Sts., Winona, M.T.
will attend to all calls as Physician, Surgeon, and
Accoucheur, in town or country, either day or
night.

In April, 1862, Drs. Ferris and Hebard associated themselves in the practice of medicine and surgery. Dr. Ferris became county coroner in 1863. He was a school district trustee in 1858.

(To be continued in the July issue.)

President's Letter

DO the physicians of Minnesota want Government control of medical practice? Do we want regimentation such as exists in Germany and Austria, or the cheap makeshift Panel System used in England? Do we want sickness insurance controlled by Government bureaus and enforced by local politicians? Do we want increased taxation to pay us reduced incomes? If so, do nothing and they will come.

Because the Wagner Bill of last year has not been passed is no evidence that the danger of Government control of medical practice is over. The desire to control our profession is just as strong as ever, but a general election has crowded it temporarily into the background. The European war may be another factor.

The latest news is to the effect that socialized medicine is a political issue in California. This brings the threat to our very door. To offset cut-rate clinics and this danger of socialized medicine (state control of medical practice), the five thousand physicians in California are placing their hopes in the California Medical Service plan. For Government control of medical practice has been the death-knell to freedom for the physician in every country in which it has been introduced.

What effective measures can be used against this danger? There are several.

First of all in importance is the physician himself. Every doctor has patients and friends who trust him. Every physician owes it to himself to become thoroughly informed on these matters and to pass this knowledge on to every individual within his range of contact; church organizations, service clubs, fraternal societies, and social contacts of all kinds should be used in a thorough educational program.

The State Committee on Interprofessional Relations plans on holding four large district meetings this year. The members of the other professions must realize that if our profession is regimented, their turn will come next; already the lawyers are hearing rumblings.

But the only organization of national scope in this country to carry on this work is the "National Physicians Committee for the Extension of Medical Service." This is an organization of physicians formed for just what its name indicates—the extension of medical service, and to fight the threatened imposition of socialized medicine. This Committee is made up of physicians of national reputation and each member is of the highest standing. It includes a recent past-president and several trustees of the American Medical Association; all are leaders in organized medicine. Annual financial contributions to this Committee will enable it to carry out carefully prepared plans to educate the public to increased appreciation of what the American medical profession has accomplished, what it is doing, as well as to offset and effectively oppose all efforts to force socialized medicine through legislative bodies. Already about 8 per cent of the physicians of the country have subscribed to this important work and in Minnesota about 8.5 per cent. The average contribution has been ten dollars. What the Committee needs is an annual contribution from every physician in the country.

If you would do your part in the preservation of the American standards of medicine, send your check to Dr. N. S. Davis, III, Treasurer, National Physicians' Committee for the Extension of Medical Service, Pittsfield Building, Chicago, Illinois.

B. S. ADAMS, President
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

Volume 23 JUNE, 1940 Number 6

APROPOS OF "THE MAGIC BULLET"

WE owe much, in our time, to the movies. They are as widely distributed and available as gasoline. With gasoline we drive to other cities and states; we see their attractions and improve our understanding. Via the movies our eyes encompass the creations of other minds; we view on the screen the world of yesterday, today and tomorrow. We travel for many obvious reasons other than amusement and yet those vending travel inducements (the New York Fair) have found the public curiously repelled and balky where low forms of clap trap burlesque is soft pedaled. It seems that movie theatres suffer similarly.

*A Warner Brother's film starring Edward G. Robinson in the title rôle as Ehrlich.

Recently one of our larger motion picture theaters showed the "The Magic Bullet," a portrayal of the life of Ehrlich and some of the great scientists of his time, to a disappointingly small audience. The time originally allotted had to be shortened because of the lack of interest on the part of the theater-goers. The part of Ehrlich was very capably played by Edward Robinson. The entire cast was correspondingly well suited. In the first place, the film was badly named. The idea that Ehrlich's discoveries dealt chiefly with 606 (a cure for syphilis) may have been publicized only sufficiently to cultivate a distaste among some sensitive people. This title, therefore, concealed much that was beautifully and astoundingly portrayed with a simplicity and fidelity to historical facts and settings previously missed for the most part in the distortions offered under the guise of the drama of scientific discovery. The contacts of Ehrlich with Koch and VonBehring, the allusions to the Frenchman, Roux, the type of German hospital ward, nurses and dispensaries reproduced—all were very true to form—indeed a masterpiece of technical reconstruction. For example, it is shown that when Robert Koch discovered the bacillus that carries his name, its easy identification through staining was suggested and worked out by Ehrlich. His intensive studies in immunity led him to attempt the first chemotherapy with selective dye-stuff. We should not need to be reminded that the recent achievements following Domagk (now so very fruitful and promising) represent the return to Ehrlich's early work and to his courageous outlook.

In passing, this may be a good time for us to pay homage to these German scientists, despite all the present-day Nazi outrages. Just as Lincoln's name belongs to the world because of his imperishable words and deeds in terms of eliminating slavery, so men like Ehrlich and VonBehring and the others, regardless of national origin, belong to the world for freeing mankind from shackles of disease. Those living today find it hard to appreciate the horrible menace of diphtheria that obtained at the beginning of this century. It is not generally known that syphilis

—here in Minnesota—is rapidly becoming a vanishing disease. Our profession is attempting various ways and means of giving to the public correct appraisal of the part we have played and propose to perform in keeping people alive and making living worth while. Let us not neglect a vehicle such as this outstanding Hollywood product. Let those who have seen this movie pass the word on to their friends; let those who have not seen it seek the first opportunity they have to do so.

E. L. TUOHY, M.D.

THE CASE FOR PRIVATE MEDICINE

AFTER the appearance of the articles in the March numbers of *Fortune*, *Liberty* and the *American Magazine* so derogatory to medical practice and the profession in our country, the admirable article entitled "The Case for Private Medicine," which appeared in *Nation's Business* for May, was a surprise and cause of considerable satisfaction.

If anyone believes that the profession has been manifesting evidence of psychopathic delusions of persecution, he should read this article which gives in detail the steps that have been taken in an attempt to fully socialize medical practice in the United States.

"The Case for Private Medicine" is the fifth of a series of articles advocating private initiative in contradistinction to regimentation, the previous articles having dealt with insurance, investment banking, power and light and distribution.

We believe in the great power of public opinion. Although frequently the majority shows stupidity in its choice of leaders or public measures, this is generally due to lack of information. In the long run, the opinion of the majority seems to muddle through and is safer to rely upon than the leadership of one individual or a small group. It is, therefore, satisfying to find this article giving in detail "The Case for Private Practice" in the organ of the National Chamber of Commerce, which has a circulation of 350,000.

Our system of medical practice is only one of a great number of activities that have been attacked by a group in government circles with the obvious aim of doing away with private enterprise.

While there has been a distinct trend in public thinking in favor of more government control of business activity in order to eliminate certain

bad practices and to alleviate misfortune, such as that due to non-employment and old age, the pendulum has swung so hard that government has come not only to control, but has interfered with business, and in any number of fields has entered into competition. In no sphere has government competition been more in evidence than in medical practice.*

Certainly the majority of American citizens do not favor a socialistic form of government. Calling attention to the trend in that direction should be sufficient to halt government control to the point of obstruction and competition with private enterprise.

DOCTORS HAMILTON AND WRIGHT

AT times we become rudely awakened to the fact that time is "swift a flying." The recent loss through death of two former members of the Editing and Publishing Committee of MINNESOTA MEDICINE, Dr. Charles B. Wright and Dr. Arthur S. Hamilton, has been a double blow.

Dr. Hamilton became a member of the committee in 1929 and gave the Committee the benefit of his mature judgment until illness incapacitated him in January 1935. Loved and respected by all who knew him, he was a valuable addition to any committee meeting. His long years of illness although relieved by a period of remarkable improvement was a source of sadness to all. His passing on June 2, must have been a welcome relief. Our next issue will contain a detailed sketch of his life.

In 1935 Dr. Hamilton was succeeded on the Committee by Dr. C. B. Wright. Intensely interested in all affairs of medical organization his years of experience in county, state and national medical affairs made his opinion on matters of policy of special value. His passing on May 31 came as a shock to many who did not know of his recent illness. A sketch of his unusually active medical career appears elsewhere in this issue.

MINNESOTA MEDICINE owes much to these two men and takes this occasion to express its appreciation of their gratuitous but none the less valuable services. The individual members of the Committee who met and came to know both Dr. Hamilton and Dr. Wright feel a very personal loss.

*In this connection it may be noted the intention of the Veterans Bureau to add 700 beds to the Fort Snelling Veteran's Hospital. Also that admissions to Veteran's Hospitals in 1939 totaled 165,576 (an increase of 8 per cent over the previous year), 92 per cent of which were for disabilities not connected with war service.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

A VERY IMPORTANT COMMUNICATION WHICH EVERY PHYSICIAN SHOULD READ

Supreme Court of Minnesota Rules Injured Workman May Select Own Physician under Workmen's Compensation Act

In an opinion written by the Hon. Clifford L. Hilton, Associate Justice, the Supreme Court of Minnesota on May 3, 1940, unanimously held that under the Minnesota Workmen's Compensation Act an employee who insists upon treatment of his compensable injury by a physician of his own choice, can obtain from his employer, or the employer's insurance carrier, the reasonable value of the services rendered by such physician, notwithstanding the fact that the employer is ready and willing to furnish and pay for medical treatment by a physician designated by the employer. Written notice of this decision of the Supreme Court has previously been sent to every member of the Minnesota State Medical Association, and the Supreme Court's opinion is published in full below.

The decision of the Supreme Court was rendered in the case of Carmody v. City of Saint Paul, and arose from the attempt by certain Municipal officials to compel City employees, who were injured in line of duty, to be treated by one of five Saint Paul physicians who were designated, and who served at the pleasure of the Corporation Counsel. Mr. Carmody, a fireman, was injured in line of duty and insisted upon being treated by his family physician. Notwithstanding the fact that the City of Saint Paul paid the hospital bill and Mr. Carmody's wages, it refused to pay for medical care in the sum of \$110.00 which had been stipulated as a reasonable amount for the services rendered. The case was heard before the Industrial Commission and a decision was rendered in favor of the City of

Saint Paul. Mr. Carmody after conferring with the Central Council of Public Service Employees of the City of Saint Paul appealed to the Supreme Court of Minnesota. At the September 1939 meeting of the Council of the Minnesota State Medical Association it was unanimously voted to request permission of the Supreme Court of Minnesota to file a brief amicus curiae (as friend of the Court) in the case, particularly in favor of a medical allowance to Mr. Carmody, and for reversal of the order of the Industrial Commission. Such a brief was prepared and filed by legal counsel for the Minnesota State Medical Association. A similar brief was also filed by legal counsel for the Minnesota State Federation of Labor. A brief in support of the position taken by the City of Saint Paul was filed by legal counsel for the Minnesota Employers Association.

The Council of the Minnesota State Medical Association is very much gratified by the results achieved in this case, and especially by the clear cut opinion written by Justice Hilton. The question involved in this case has been recurring in one form or another during the past eleven years, notwithstanding the fact that the Supreme Court of Minnesota in 1922, in the case of Lading v. The City of Duluth, held that an injured workman had the right to be attended by a physician of his own choice. The law has now been definitely established; therefore the Council of the Minnesota State Medical Association wishes to point out and to emphasize to each member of the medical profession, his direct responsibility:

1. To render proper medical care to the injured employee;
2. To make a reasonable charge for the services rendered.

It goes without saying that, in the past, an extremely small number of physicians have taken

Industrial Commission

Hilton, J.; Gallagher, C. J.; Stone, J.
concur specially.

John J. Carmody,

Relator

-vs-

City of Saint Paul,

Respondent.

Endorsed:

Filed May 3, 1940

Grace Kaercher Davis, Clerk
Minn. Supreme Court.

SYLLABUS

Certiorari to the industrial commission.

Held, that under the workmen's compensation act, an employee who insists upon treatment of his compensable injury by a physician of his own choice can obtain the reasonable value of the services rendered by such physician although the employer is willing and ready to the knowledge of the employee to furnish and pay for proper medical treatment by a physician of the employer's choice but not otherwise.

Order reversed and cause remanded with directions.

OPINION

HILTON, Justice.

Certiorari to the industrial commission.

Relator was employed by the city of Saint Paul as a fireman. On December 29, 1938, he suffered an injury during the course of his employment. Upon entering the hospital, relator requested and obtained his family physician, Dr. H. A. Molander, to render the necessary medical attention. Relator refused treatment by doctors designated by the city to minister to employees injured in the line of duty. Compensation during the period of disability and hospital expenses have been paid by the city. It refuses to pay the \$110.00 incurred for medical treatment on the ground that relator refused its proffered assistance by one of its designated physicians. There is no question that the city was ready, able and willing to give proper medical treatment through one of its specified physicians and would have done so but for relator's refusal.

Previous to the time of the injury, the city council determined that in some instances, which it thought occurred too frequently, injured city employees were being given improper treatment and the city was being overcharged by doctors. Proposing to remedy the situation, a resolution was passed providing for the designation of five doctors to treat employees. Notices were posted in fire barns giving the names of the physicians and directing that "any employee * * * injured in the line of duty, shall report to any of the following doctors for treatment. The City of Saint Paul will not be responsible for medical bills incurred elsewhere." By the resolution, it was provided that if the injured employee had a family physician the city "shall pay the reasonable cost of consultation by said physician when such consultation is requested of the City by the employee or any member of his or her family." Relator was fully acquainted with the contents of the cards that were posted.

Presented then is the question whether an employee, who insists upon treatment of his compensable injury by a physician of his own choice, can obtain under the workmen's compensation act the reasonable value of the services rendered when the employer is willing and ready to the knowledge of the employee to furnish and pay for proper medical treatment by a physician of the employer's choice but not otherwise.

The referee and the industrial commission both took the view that the relator's claim should not be allowed.

Decision requires that the provisions of the compensation act as amended from time to time be con-

advantage of the employer, or his insurance company. In fact such a situation resulted in the suspension of a member of the Ramsey County Medical Society for fourteen months. It is, however, unnecessary to admonish the great majority of the medical profession to do good work and charge a reasonable amount for their services. On the other hand, it should be distinctly understood that any abuses in the future that are of a deliberate or wilful nature, will be severely dealt with, not only with respect to membership in the Minnesota State Medical Association, but also, I am confident, insofar as state licensure is concerned; moreover other penalties are available under the laws of this state. The Minnesota State Medical Association cannot, and does not intend, to sit idly by and have the rights and privileges of the majority of the ethical practitioners endangered by a few physicians who seem to have little regard for their public obligations.

The Council requests that every member acquaint himself with this decision of the Supreme Court. Justice Hilton's opinion clearly sets forth the construction that is given to this section of the Workmen's Compensation Law, and the law is now definitely settled that an injured employee, who is entitled to benefits under the Workmen's Compensation Act, may be treated by his family physician or a physician of his own choice.

The Council of the Minnesota State Medical Association is working on a plan whereby certain difficulties that may arise in the future, not only with reference to the type of medical care being rendered, but also as to the fee charged by the physician, may be referred to a committee of physicians for such recommendation as may be proper under the circumstances. A similar plan has been employed successfully throughout the State of Minnesota in relief cases. It is the duty of the medical profession to be fair to the injured employee, to the employer, to the insurance carrier, and to the medical profession as a whole. The Council therefore earnestly requests the highest type of coöperation from all the members in this matter.

Most respectfully,

Minnesota State Medical Association,
By H. Z. GIFFIN,

Chairman of the Council.

sidered for here is the source of much of the disagreement.

The original compensation act adopted in 1913, L. 1913, c. 467, Sec. 18, provided:

"Such medical and surgical treatment * * * as may be reasonably required at the time of injury and thereafter during the disability, but not exceeding ninety (90) days, to cure and relieve from the effects of the injury, the same to be provided by the employer and in case of his inability or refusal seasonably to do so, the employer to be liable for the reasonable expense incurred by or on behalf of the employee in providing the same; provided, however, that the total liability * * * shall not exceed the sum of one hundred dollars * * *."

In 1921, after study by an interim committee, amendments were made to the 1913 law. By L. 1921, c. 82, Sec. 19, it was enacted that such medical and surgical treatment "as may reasonably be required at the time of the injury, and during the disability for not exceeding ninety (90) days and not exceeding one hundred (\$100.00) dollars in value, to cure and relieve from the effects of the injury, shall be provided by the employer and in case of his inability or refusal seasonably to do so, the employer shall be liable for the reasonable expense incurred by or on behalf of the employee in providing the same * * *."

Added to the compensation act in 1921 was the following:

"The Commission may upon the petition of an **employee** and a proper showing of cause therefor order a change of physicians and designate a physician suggested by the injured employee or by the commission itself in such case the expense thereof shall be borne by the employer * * *" on the same terms as provided in the section previously quoted. (Bold supplied.)

The report of the interim committee of the house of representatives to the 1921 legislature stated with reference to the provision permitting the commission to order a change of physicians on the petition of the employee as follows:

"(11) Provision authorizing the Industrial Commission to order a change of physicians on the application of the injured person to some physician named by the injured employee or the Commission itself. This provision is intended to overcome the objection to permitting the employer to select any physician and require the employee to accept him."

At this point the case of Lading v. City of Duluth, 153 Minn. 464, 190 N. W. 981, decided December 1, 1922, must be inserted into the picture. Lading, an employee of the city of Duluth, suffered compensable injuries. The city had in its employment a physician who would have treated plaintiff had he consented. Instead, plaintiff called one of his own choice. He then sought to obtain the reasonable value of the physician's services. The city resisted the claim on the ground that since there was a regular city physician who would have rendered medical treatment, the employee was not entitled to be reimbursed. Section 19, of the 1921 compensation law, was the statute which we had to consider. We held that Lading could not recover the reasonable value of the rendered services since "To justify a recovery of the reasonable value of the services of a physician called by the employee, it must appear either that the employer was unable to furnish one or that he refused to do so. Upon this the statute leaves no doubt but the requirements thereof were not met by the plaintiff." Under the statute of 1921, one of these alternatives had to be established before the reasonable value could be recovered. However, it was also held that the employer was liable to reimburse Lading to the extent of \$100.00, the statutory limit at this time. We there said, p. 467,

"But we are of the opinion that the statute should not be construed to impose upon the employee the unqualified obligation to accept the physician selected by the employer, or forfeit the right to reimbursement

there given. It often happens, a situation perhaps more or less general, that the employee has a family physician to whom he prefers to turn in case of injury or sickness, rather than accept the services of another with whom he has no acquaintance or in whom perchance he has no confidence. In that situation, he should have the option or unquestioned right to choose his medical attendant, or accept the one tendered him by the employer but within the limits of liability on the part of the employer imposed by statute. The statute contains no language unconditionally requiring the latter to accept the physician tendered him or relinquish the right of reimbursement altogether, and we construe it to give him that option * * *."

If the report of the interim committee exemplifies the intention of the legislature in amending the provision with respect to medical treatment, there is little room for doubt that the construction adopted by this court diametrically opposed the purpose of the law makers. But before we can consider impeaching the Lading decision, attention to legislation after that case was determined must be given. In this, perhaps, will be found convincing reasons why we should not alter that decision.

In 1923, the legislature convened and amended section 19 which had been the subject of construction in the Lading case. As amended it read, L. 1923, c. 300, Sec. 6,

"The employer shall furnish such medical * * * treatment * * * as may reasonably be required at the time of the injury, and during the disability for not exceeding ninety days to cure and relieve from the effects of the injury, provided that in case of his inability or refusal seasonably to do so, the employer shall be liable for the reasonable expense incurred by or on behalf of the employee in providing the same; * * *"

"The Commission may at any time upon the request of an **employee** or **employer** order a change of physicians and designate a physician by the injured employee or by the Commission itself and in such case the expense thereof shall be borne by the employer * * *." (Bold supplied.)

As we understand the statutes, despite the fact that in the 1921 enactment the words "shall be provided by the employer" were used while in the 1923 statute it reads, "the employer shall furnish * * *," the fundamental rights and duties of the employer and employee are substantially the same under both statutes except that the financial limit on the employer's liability is removed by the 1923 law and the employer is given the right to apply for a change of physicians. Manifestly the 1923 legislature could have specifically provided that the employer could designate a physician which the employee must accept or forfeit any claim against the employer for physician's services. But it did not. Instead it enacted a statute which was, so far as substance is concerned, the same as the 1921 statute except for the two mentioned changes. It must be remembered that the Lading decision was decided under the 1921 enactment. As additional evidence that the 1923 legislature accepted the holding of the Lading case is the fact that in 1923 the employer was given the right to apply for a change of physicians. By removing the \$100.00 limitation found in the 1921 statute, the substantive obligation of the employer as determined in the Lading case was not destroyed.

In 1929, the legislature convened and adopted amendments to the compensation law. L. 1929, c. 248 (1 Mason Minn. St. 1927, Sec. 4279) amended the medical provisions of the 1923 act. The provisions of the 1923 law were for all practical purposes re-enacted except that the 90 day limit was dropped. Consequently, despite more than ample opportunity to alter the rule of the Lading case, the legislature has not done so. With this background, we do not think it is fitting that we should now re-examine the Lading decision to determine its soundness or unsoundness as an original proposition. Since the legislature has, in effect, adopted that holding and it has become a part of the compensation law, it

is more proper that if any change is to be made at this late stage the legislature should do it.

We think that the employe should have been awarded the mount claimed which the parties have stipulated is reasonable. Under the statute, if the city is of the opinion that improper care is being given an employe, it can apply for a change of physicians. If the occasion again arises where the city officials think excessive charges are being made, application can be made to the commission for a determination. These safeguards have been adopted by the legislature to prevent abuses which might arise.

So that there may be no doubt in the future, it is proper to discuss some of our decisions which counsel have cited.

In *Bookman v. Lyle Culvert & Road Equipment Company*, 153 Minn. 479, 190 N. W. 984, the decision of the Lading case was applied in a situation where the employer denied liability for the injury. Nothing in the opinion is in conflict with the Lading case.

Zobitz v. Oliver Mining Company, 167 Minn. 424, 209 N. W. 313, involved a case where the employe had his injury treated by the physician designated by the employer. The treatment continued for more than 90 days, the statutory limit at that time. Nearly a year after the injury, the employe went to a doctor he selected. Since the employe never obtained an extension of the period of treatment, the employer was not liable for the additional treatment. Consequently, it was immaterial to the decision to say anything about the failure of the employe to apply for a change of physicians. The question presented here was never actually reached in the *Zobitz* case.

Lund v. Biesanz Stone Company, 183 Minn. 247, 236 N. W. 215, is relied upon by respondent. There is nothing to show that the employe involved there ever objected to treatment by a physician designated by his employer nor did the parties question the power of the commission to order submission to treatment by a physician selected by the employer. We do not think the issue here raised was there involved.

In *Clausen v. Minneapolis Street Ry. Co.* 186 Minn. 80, 242 N. W. 397, the employer denied liability for the injury and the employer's selected physician told the employe to return to the doctor he first consulted. On these facts, it was held that the commission was fully justified in requiring the employer to pay the expenses of the employe in obtaining the treatment. Obviously the case never decided the question here.

Fitzgibbons v. Clarke, 205 Minn. 235, 285 N. W. 528, did not involve anything touching upon the present case.

Relator will be allowed \$100.00 attorney's fees in this court.

Since it has been stipulated that the amount of the claim is reasonable, the order is reversed and the cause is remanded with directions to award relator the \$110.00 spent in employing his own physician.

Order reversed and cause remanded with directions.

GALLAGHER, Chief Justice, concurring specially:

It seems to me that the court misconstrued the provisions of L. 1921, c. 82, Sec. 19, in *Lading v. City of Duluth*, 153 Minn. 464, 190 N. W. 981, when it held Sec. 19 thereof to vest in an injured employe the right to select a physician of his own choice. That section required an employer to furnish such medical, hospital and other expenses specified as might reasonably be required, within limits as to time and amount provided in the act, to cure and relieve an injured employe from the effects of an injury. Then followed the provision which gave to the employe the right to petition the industrial commission for a change of physicians clearly indicating a legislative intent to give to the employer the original right of selection. It reads:

"The Commission may upon the petition of an employe and a proper showing of cause therefor order a change of physicians and designate a physician suggested by the injured employe or by the Commission itself and in such case the expense thereof shall be borne by the employer upon the same terms and conditions as hereinbefore provided in this section for medical and surgical treatment and attendance."

While the exact question presented in the *Lading v. City of Duluth* case, supra, does not appear to have been before the Court since that case was decided in 1922, the principle involved has been referred to in a number of subsequent decisions. *Zobitz v. Oliver Iron Mining Co.* 167 Minn. 424, 209 N. W. 313; *Lund v. Biesanz Stone Co.* 183 Minn. 247, 236 N. W. 215; *Clausen v. Minnesota Steel Co.* 186 Minn. 80, 242 N. W. 397. These references have all indicated a view out of harmony with that expressed in the *Lading* case. The courts of other states having compensation acts similar to ours have almost universally followed the opposite rule. *Johnson v. Roberts*, 212 Ala. 535, 103 So. 563; *Cella v. Industrial Accident Commission*, et al. 38 Cal. App. 760, 177 P. 490; *Olstead v. Lamphier*, 93 Conn. 20, 104 A. 488; *Johnston v. A. C. White Lumber Co.* 37 Ida. 617, 217 P. 979; *Swift & Co. v. Industrial Commission*, 288 Ill. 132, 123 N. E. 267; *Indiana Liberty Mut. Ins. Co. v. Strate*, 83 Ind. App. 493, 148 N. E. 425; *Almquist v. Shenandoah Nurseries*, 218 Ia. 724, 254 N. W. 35; *Coleman v. Butler*, 166 La. 138, 116 So. 828; *Gardner v. Michigan Sugar Co.* 231 Mich. 331, 204 N. W. 100; *Schutz v. Great American Ins. Co.* 231 Mo. App. 640, 103 S. W. (2) 904; *Radil v. Morris & Co.* 103 Neb. 84, 170 N. W. 363; *Grogan v. Granger*, 16 N. J. Miscellaneous 533, 2 A. (2) 884; *Johnson v. Armstrong*, 41 N. Mex. 206, 66 P. (2) 992; *Szold v. Outlet Embroidery Supply Co.*, 159 Miscellaneous N. Y. 911, 289 N. Y. Supp. 411; *Skelly Oil Co. v. Barker*, 132 Okla. 279, 270 P. 566; *Smith v. State Industrial Accident Commission*, 104 Ore. 640, 208 P. 746; *Security Union Ins. Co. v. McClurkin*, (Tex. Civ. App.), 35 S. W. (2) 240; *City of Milwaukee v. Miller*, 154 Wis. 652, 144 N. W. 188.

However, the legislature has seen fit to permit the compensation act to stand substantially as it was when the *Lading* case was decided, altering its effect, in so far as the right to select a physician is concerned, only to the extent of permitting the employer, as well as the employe, to petition the industrial commission for a change of physicians. (L. 1923, c. 300 Sec. 6.) Because of the failure of the legislature to amend the statute so as to negate the *Lading* case, I feel compelled to join the other members of the court in accepting the rule there enunciated as the law.

There is much to be said in favor of permitting an employe who is injured to select his family physician or some other physician of his choice. There is also much to be said in favor of giving to the employer, who is required to pay the bills, a voice in the selection of the physician. This is a matter of policy, however, for determination by the legislature and is not a question which concerns the court.

STONE, Justice.

I concur in the opinion of Mr. Chief Justice Gallagher.

MINNESOTA'S RELIEF PLAN

The close working agreement recently cemented between the medical profession of Minnesota and the Division of Social Welfare occupied the center of the stage at the Rochester meeting.

It was praised as a practical strategic measure and as a symbol of democracy at work.

It was generally accepted as an instrument by which most of the vexing problems of medical care for Minnesota's needy may be satisfactorily solved.

In outline, the plan is as follows: A State Medical Advisory Committee of which Dr. A. W. Adson of Rochester is chairman, has been appointed by Walter Finke, director of the Division, from a panel of names drawn up by the Council. The committee has a quasi-official status and it meets regularly once a month. It came into being at the request of Mr. Finke and has the assurance of this enterprising lawyer-executive that no medical policies will be issued by his Division without its approval.

Committees Revived

The first joint act of the Division and the Committee was to proclaim the need for similar medical advisory committees to act with the local welfare boards in each county. With the approval of the Council the old County Contact committees, lately inactive in many quarters, were resurrected to assist the welfare boards in each county until new personnel could be appointed by the county medical societies involved—provided the societies wished to make such changes. The name "County Contact Committees" was retained temporarily but was to give way to the name "County Medical Advisory Committees" as soon as the House of Delegates could take official action at the annual meeting.

The committees thus established are to be active, essential parts of the relief and welfare machinery in every county. They will determine medical needs, settle medical differences, aid in solution of the problem of medical emergencies, help county boards to hospitalize clients economically, and efficiently and prevent, if possible, large expenditures for hospitalization plus transportation and other living expenses at the University hospitals for cases which can be cared for at home.

This is the plan. It will work if the county boards utilize the committees to the full as they have already been urged to do by the state administration—and if the doctors who comprise the committees serve faithfully, impartially and with intimate understanding of the problems of the board as well as of physicians and patients.

Discipline Included

It will work if the doctors are, furthermore, determined to discipline the occasional practitioner from their own membership who overcharges or who attempts to take advantage of the program to recoup private losses.

Questions which cannot be settled by local adjustment may be referred to the state medical advisory committee and settled in consultation with the Division of Social Welfare.

The entire plan was described by Governor Harold E. Stassen in his banquet address Tuesday, April 23, as a pattern for the proper approach to the sphere of coöperation between a profession and the government in meeting social problems.

Profession Praised

"If and when we are content to let government solve these problems, we are submitting to totalitarianism and dictatorship," Governor Stassen said.

"The medical profession has not adopted this attitude of 'let the government do it.' Instead it has proceeded on the fundamental tenet that if a problem can be solved by private initiative, then that is the manner in which it must be solved. And it is in this manner that we must solve our problems in America if we would save our democracy."

On the same day Mr. John Pratt, executive secretary of the National Committee of Physicians for Extension of Medical Services, declared that the Minnesota system of Advisory Committees to consult with County Welfare Boards commends itself to national attention.

"Problems Would Be Settled"

"If the physicians and welfare officials in every county in the United States would work together as you plan to do here in Minnesota," he said, "the problem of medical care for the indigent would be settled in six months."

As a result of the collaboration of the state committee and Mr. Finke's Division three new sets of regulations have been issued, by the Division, to date, to County Welfare Boards. They concern, first, the establishment of the Medical Advisory Committees; second, the new arrangements for medical care of recipients of Old Age Assistance; and third, new arrangements for medical care of the recipients of Aid to Dependent Children.

Study Announced

A thorough-going study of the entire problem of medical care to relief clients is now under way under auspices of Mr. Finke's department. This study will go into every phase of previous experience under the State Relief Administration and into experience of physicians as well.

Out of the findings, it is hoped that a sounder estimate of the relative place of medical costs in the relief appropriation may be arrived at and also a better and more uniform standard for payment of physicians' fees.

In the meantime, the threat of a return from the free-choice-of-physician basis to a county physician basis has threatened in several quarters where County Welfare Boards have been charged or fancied they have been charged an exorbitant amount for medical services.

All physicians everywhere are urged to cooperate closely with their local boards to keep their charges within limits mutually determined in their own counties by physicians and officials. In many localities the fees may be totally inadequate but every effort should be made to keep the principle of free choice in the plan of caring for the needy, pending adjustments that will undoubtedly follow upon the studies of costs made by the Division of Social Welfare.

NATIONAL COMMITTEE HEAD SPEAKS

Praise for starting the ball rolling which later became the National Committee of Physicians for Extension of Medical Service was extended to Minnesota physicians by Mr. Pratt in an address before the Minnesota branch at a luncheon meeting arranged at Rochester, April 23, by Chairman F. J. Savage.

The first organization meeting of the Committee was held in Minnesota, Mr. Pratt reported, and that first Minnesota meeting preceded the National organization meeting in Chicago by several days.

This new movement among physicians is the first of its kind in the history of medicine, Mr. Pratt declared in Rochester, and its objectives are: first, to inform the public about the accomplishments of medicine during the past 150 years; second, to convince the people that they have a vested interest in medicine which nothing must be allowed to imperil and third, to extend

medical service, wherever extension seems to be needed.

"We must get to the American people the story of what medicine has accomplished," Mr. Pratt said. "It is a story that has no equal in the history of the world.

"We must also convince the people of their own interest in medical service so that they will act to protect that interest and we must work to extend the service, step by step, so that no one in America will ever be forced to go without needed care."

The first essential to a proper handling of the economic problems associated with medical service is to establish the dividing line between the medically indigent and those who can and should pay for their own service, Mr. Pratt pointed out.

"The theory that every man, woman and child is entitled as of right and without charge to the ultimate in medical service is essentially false," he said. "I know of no way to cope with the medical aspects of our social and economic problems except to build block by block as the need arises and as you propose to do with the aid of your Division of Social Welfare in Minnesota."

A remarkable extension of interest in the new organization in all parts of the United States was reported by Mr. Pratt. Membership has grown amazingly and thousands of pieces of literature have been distributed. The National Committee of Physicians for Extension of Medical Service is an independent organization financed by physician members and designed for purposes of public education in the accomplishments and future needs of medicine. It is not affiliated in any way with the American Medical Association except as members of the committee are also members of the national medical organization.

Appeal for Contributions

The following paragraph from the *Pittsburgh Medical Bulletin*, May 18, 1940, is worthy of note:

"The National Committee of Physicians for the Extension of Medical Service will have a two-page advertisement in the *Saturday Evening Post* for June 22. . . . This form of advertising, believed to be more stable than some other forms, is something physicians have been wishing for and asking for ever since Public Relations Activities were first approved by medical societies. As is well known to all, such advertising is costly. Each contribution will assist, however, in pre-

serving, free from centralized control, for the American People, the highest level of health ever known—a priceless heritage, indeed!"

Members of the Minnesota Branch join with the national organization in an appeal for contributions from every physician to carry on this campaign.

APPROVED BY THE HOUSE

Outstanding among actions taken by the House of Delegates at Rochester, April 21 and 22, were the following (see also complete proceedings of the House of Delegates to be printed in full in an early issue of MINNESOTA MEDICINE):

For Statewide Immunization

An outline for organization of county immunization and vaccination programs was submitted by the Committee on Vaccination and Immunization of which Dr. L. R. Critchfield of St. Paul is Chairman, and it was approved both by the Council and the House of Delegates. The outline is available to any county medical society at the State Office and will stimulate state wide efforts on the part of medical societies, it is hoped, to carry on this essential public health program.

New Tuberculosis Program

Approval of delegates was extended to preliminary plans for an intensive tuberculosis control program under state medical association direction in Minnesota. The tentative plans call for intensive methods including universal tuberculin testing and x-raying in one test county. Methods of organization and financing have yet to be worked out by the Sub-Committee on Tuberculosis of which Dr. J. A. Myers of Minneapolis is Chairman.

No Statewide Insurance

The recommendation made by the Committee on Sickness Insurance, of which Dr. A. W. Adson of Rochester is Chairman, that no statewide plan for sickness insurance be set in motion for the time being in Minnesota was approved by the Delegates. This action does not prevent county medical societies from taking action of this type if they see fit.

In this connection, it is of interest to note, in the report of the Committee on Medical Econom-

ics, of which Dr. W. F. Braasch of Rochester is Chairman, that experiments in voluntary sickness insurance elsewhere do not appear to be working out to the satisfaction of their promoters.

"People who can well afford to pay for care on the old basis are availing themselves of the service," according to the report, "but so far, people in the lower income group for which the service was designed are not being reached."

Recommendations Delayed

Upon recommendation of the Committee to Study Motor Vehicle Accidents of which Dr. J. C. Hultkrans of Minneapolis is chairman, the delegates decided not to approve any specific methods for testing the volume of alcohol in the blood or secretions, nor to name any specific percentage of alcohol which is to be regarded as intoxicating, at this time. The Committee and the Association will continue its studies, however, and will work toward establishment of legislation on this matter when sound methods have been determined.

New Gavel

The delegates accepted the gift of a unique hand-carved gavel from Dr. W. S. Lemon of Rochester, who was present himself at the final meeting of the delegates to explain the symbols he carved into the handle and surfaces.

The handle is a rough hewn bit of Minnesota walnut upon which the artist has carved the rod of Aesculapius and coiled about it is the single snake which formed, with the rod, the original signum of this greatest of the Greek gods of medicine.

The signum of Aesculapius was used throughout the world, according to Dr. Lemon, until the reign of Henry VIII of England, when a confusion occurred and the symbol of Hermes the messenger, king of robbers and god of commerce, was substituted for the rod of Aesculapius. The mistake was later corrected in England but the symbol of Hermes with the wings at the top of the rod to show the speed of the messenger and the two coiled snakes still persists in this country. Hermes had few and slight connections with medicine other than the connection involved in the speed of his service.

On the face of the gavel is a beautifully designed open book and on the opposite surface a Grecian lamp. The gavel was accepted with the

enthusiastic thanks of the delegates by Speaker W. W. Will and will be used at all future sessions of the House.

THE COUNCIL MEETS

Three major insurance companies are writing malpractice insurance in Minnesota. The Council heard representatives of each of them at their first Rochester session and also a report on a comparative study of policies made by Attorney F. Manley Brist. At the recommendation of Mr. Brist and the Medical Advisory Committee it was decided that none of these companies should be singled out for special recommendation but that members should be urged to study all of them and select the policy that protects them best.

Rates for the three companies as reported to the Council are as follows:

Medical Protective Co.

In Ramsey and Hennepin Counties:

\$2,500/7,500	\$5/15,000
Pre. \$21.00	\$25.00

Out-state:

\$2,500/7,500	\$5/15,000
Pre. \$25.00	\$29.00

Lumbermen's Mutual Co.

\$5/15,000	\$10/30,000	\$15/45,000
Pre. \$25.00	\$34.25	\$41.75
Div. 5.00	6.85	8.35
Net \$20.00	\$27.40	\$33.40

Aetna Surety and Casualty Co.

\$10/30,000	\$20/40,000	\$25/50,000
Pre. \$30.00	\$33.47	\$35.31

The Aetna premium rate at \$10/30,000 shows the \$3.00 reduction secured by the Council which went into effect May 1, 1940. Where a partnership exists, Aetna charges an additional \$5.50 for each member of the partnership at \$10/30,000 limits to protect all if one is sued. The fee is somewhat larger at the higher limits. This business liability protection is included in the premium charged by the other two companies.

Surplus—1939

Association finances are in excellent shape in the opinion of Council members who decided to leave it to the Finance Committee of the Council

to determine the disposition of the 1939 surplus of some \$5,000. Finance Committee members may add the 1939 surplus to the investment fund if they see fit.

Figures for the Rochester meeting are not yet available but a profit is assured, the Council was told.

Examination Fees

The question of fees to be charged for physical examinations of applicants for Civil Service positions has been discussed from time to time and was brought for an opinion to the Council at this meeting. In view of the fact that the examinations are by no means complete, it was suggested that the fee might well be in the neighborhood of \$2.00 to \$3.00. The suggestion of the Council was not, however, to be construed as binding upon any individual physician.

Rest Homes

Rest homes, convalescent and nursing homes, so-called, are not licensed by the state nor are they subject to official regulation. The possibility of establishing some kind of official control over these institutions was discussed by the Council and the entire matter was referred for a special study to the Committee on Hospitals and Medical Education. Further action will be taken when the results of this study are reported to the Council.

More Time for Delegates

It will be recommended to next year's Committee on Scientific Assembly that the House of Delegates convene for its first session in the afternoon of the day preceding the opening of scientific sessions instead of in the evening. The delegates will then recess at 4 p. m. to permit reference committees to convene and the entire evening session will be given over to official action on committee reports and other association business.

Insufficient time is available to hear distinguished guests and also to give proper attention to the program of the association under the present plan, Council members believe. They plan to make an effort, also, to see that all delegates report fully to their county medical societies on the proceedings of the House and on economic matters generally.

Literature on the Other Side

Literature and reference materials on sickness insurance and government medicine, generally, will be placed in the principal libraries of the state this year by authorization of the Council.

A great deal of material is available in support of government intervention in the health program of the nation, but students find little in school or municipal libraries on the other side of the picture, it was pointed out. Responsibility for securing the literature and distributing it was placed upon the Executive Committee of the Committee on Medical Economics and the Finance Committee of the Council.

New Child Health Committee

A new committee on Child Health will be appointed this year by the President. This committee will take the place of the former Sub-Committee on Child Health which was part of the Committee on Public Health Education. The change in status and character of the Child Health Committee was made by the Council as a result of a petition from the former committee signed by Chairman R. L. Kennedy of Rochester.

It is the opinion of the Committee, shared by the Council, that the numerous scientific problems relating to Child Health are of sufficient importance to warrant the appointment of a special scientific committee to consider them and that the educational aspect of child health problems can well be handled through the Committee on Public Health Education by making the Chairman of the new Committee a member of the Education Committee. It was recommended that the members of the new committee be selected from chairmen of other committees whose work is related to child health, such as the Committee on Vaccination and Immunization and that the latter committee, especially, might function as a sub-committee of the new Committee on Child Health.

Hospital Insurance Requested

Requests have been received by the Minnesota Hospital Service Association recently for extension of group hospitalization to Owatonna, Red Wing, Winona and Faribault. Following the policy already established by the Council, the hospital service association was asked to take the matter up with each county medical society involved.

Women's Program Endorsed

The program of the Women's Field Army Against Cancer under direction of Mrs. Harlow Hanson of Minneapolis, was again endorsed by the Council and members were urged to co-operate in their own communities with the women's organization.

YOUR INSURANCE POLICY

(Monthly Editorial Prepared by the Medical Advisory Committee)

Recently the writer was asked the following pertinent question: "What points should be covered in a malpractice insurance policy to give complete coverage to a medical man?" This was the answer:

1. The policy should be written in a company organized and conducted on a sound business basis, large enough and old enough to have a reserve ample to take care of all emergencies.

2. The company should have local or state officers who are familiar with local conditions, and local representatives capable of giving the matter quick and thorough investigation; also legal talent who can rapidly scrutinize the findings of the investigation, and then as quickly sense the merits of the case.

3. The premiums should be reasonable and in line with the risk carried. Loss ratio has much to do, as we have lately seen, with cost.

4. To be protected fully, all claims or damages arising out of professional services rendered (not against the law) should be covered, as well as those services performed by a partner, assistant, nurse or any other agent.

5. The ideal policy has a clause in it which states that the policy is non-cancelable for any reason whatsoever, during its term.

6. The limits of the policy should be adequate to protect one fully under the law. The value of a life under the law being set at a known figure should be a criterion as to the lowest limits. The upper limits should be those compensurate with the type of work being done by the purchaser of the policy.

7. The policy should have a provision that no settlement can be made except by consent of the insured.

—B. J. B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Belle Plaine Drug Addict Sentenced for Obtaining Narcotic Drugs by Fraud and Deceit

Re. State of Minnesota vs. Merten J. Stratton.

On April 2, 1940, Merten J. Stratton, forty-four years of age, of Belle Plaine, Minnesota, entered a plea of guilty in the District Court of Scott County, to an information charging him with the crime of obtaining narcotic drugs by fraud and deceit. Stratton, after admitting to the Court that he had been a drug addict for over twenty years, was sentenced by the Honorable Joseph J. Moriarty, Judge of



the District Court, to a term of not to exceed five years in the State Prison at Stillwater. Judge Moriarty then ordered the sentence suspended on the condition that Stratton enter the Federal Hospital at Lexington, Kentucky, for treatment for his drug addiction. While Stratton was at liberty on a \$2,500.00 cash bond, awaiting approval of his application to enter this hospital, he again reverted to the use of morphine, and upon this being called to Judge Moriarty's attention by representatives of the Federal Bureau of Narcotics, the Minnesota State Board of Medical Examiners and County Attorney, Irwin, Judge Moriarty made an order cancelling Stratton's bond and ordering him taken into custody by the Sheriff. Stratton was then advised in no uncertain terms by Judge Moriarty, that he could choose between going to Stillwater or being taken, forthwith, to the Government Hospital at Lexington, Kentucky. Stratton chose the latter and Judge Moriarty then made an order that Stratton was to be taken to the Hospital, forthwith, by the Sheriff of Scott County, and all expenses were to be paid by the defendant, Stratton. Sheriff Mesenbrink left with Stratton on May 6, 1940, for Lexington, Kentucky.

Stratton was arrested on March 8, 1940, at Belle Plaine, Minnesota, following the filing of a complaint against him by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners. Stratton was charged with obtaining narcotic drugs by fraud and deceit following a joint investigation made by the Minnesota State Board of Medical Examiners and the Federal Bureau of Narcotics. Stratton had obtained narcotics from at least 3 physicians in that vicinity who, to say the very least, were extremely careless in their prescribing and dispensing of morphine. Stratton has been a drug addict for over 20 years, and has been arrested on numerous occasions, and has served time in the State Reformatory at St. Cloud, Minneapolis Workhouse, and at Los Angeles, California. Despite his admitted drug addiction and his previous bad record, Stratton had no difficulty whatever in obtaining narcotics from several members of the medical profession. It seems a pity that it is necessary for the Federal Government, and the Minnesota State Board of Medical Examiners to take action against physicians who have been warned, time and again, not to prescribe or furnish morphine to drug addicts; nevertheless, there seems to be only one way in which cases of this type can be dealt with. The physician from whom Stratton obtained the largest amount of

morphine, was ordered to appear before the Medical Board on May 10, 1940.

The Medical Board approves, most whole-heartedly, of the manner in which this case was disposed of by Judge Moriarty. It also wishes to acknowledge the splendid cooperation of the Minneapolis Division of the Federal Bureau of Narcotics, County Attorney Irwin, and Sheriff Mesenbrink.

Saint Paul Osteopath and Negress Assistant Given Prison Terms in Abortion Case

Re. State of Minnesota vs. Samuel M. Stern.

Re. State of Minnesota vs. Agnes L. Shanks.

Re. State of Minnesota vs. Evelyn Stern.

On May 13, 1940, Samuel M. Stern, a licensed osteopath, and Agnes L. Shanks, his negress office assistant, entered pleas of guilty in the District Court of Ramsey to an information charging them jointly with the crime of abortion. Stern was sentenced by the Honorable Kenneth G. Brill, Judge of the District Court, to a term of not to exceed four years at hard labor in the State Prison at Stillwater. The defendant Shanks was sentenced to a term of not to exceed four years at hard labor in the Women's Reformatory at Shakopee. A request for a suspended sentence in the case of the defendant Shanks was rejected by Judge Brill, who stated that the Court was unable to grant probation to a woman who had been employed by the defendant Stern seven years, and whose work required her to assist the defendant Stern in the commission of as many as two and three criminal abortions a day, according to the defendant Shank's own statement.

The defendant Stern, who is forty-five years of age, has maintained an office at 512 Hamm Building, Saint Paul, for a number of years. He was licensed to practice osteopathy in Minnesota, March 10, 1926, notwithstanding the fact that he had been previously convicted of a felony in Orange County, California, on January 3, 1922, the felony being the crime of embezzlement, and for which crime Stern was sentenced to a term of not to exceed five years in the San Quentin Prison where he served until January 27, 1923, at which time he was placed on parole. The defendant Shanks, who gave her age as thirty, stated that she had no medical training of any kind and was not a registered nurse. Both defendants were arrested on May 9, 1940, following a raid by the Saint Paul Police Department on Stern's offices in the Hamm Building. A large list of women's names and addresses and giving the date of their last menstrual period, was seized by the police, along with numerous boxes of Leunbach's Paste, a product of Merz & Company Chemical Works, Inc., Newark, New Jersey, which was being used by the defendant Stern in the performing of criminal abortions. The police raid resulted from the death on May 6, 1940, at a Saint Paul Hospital of a twenty-one year old Bemidji girl, upon whom the defendant Stern attempted to perform a criminal abortion earlier that day. The girl was taken critically ill and died that afternoon from embolic pneumonia.

The investigation subsequently made, disclosed that Stern had performed a criminal abortion on a seventeen year old Bemidji girl in November 1939. It was through the performing of this criminal abortion that the Bemidji girl, who died on May 6, 1940, learned of the defendant Stern. Stern was paid \$100.00 for each abortion. Stern and his office assistant decided to plead guilty to the abortion charge rather than face a charge of manslaughter in the first degree in the death case. The defendant Evelyn Stern, a sister-in-law of the defendant Stern, has not been apprehended as yet by the police who hold a warrant for her arrest. It is

claimed that Evelyn Stern took care of a number of these girls at her apartment after they had been aborted by her brother-in-law.

The incarceration of the defendant Stern climaxes several years of most difficult and trying work by the St. Paul Police Department, the Ramsey County Attorney's office, and the Minnesota State Board of Medical Examiners. The defendant Stern was indicted by the grand jury of Hennepin County on March 19, 1935, on a charge of manslaughter in the first degree, the indictment alleging that Stern performed a criminal abortion on a Minneapolis girl who died on March 8, 1935, as the result of that abortion. Stern was also indicted by the grand jury of Hennepin County on April 11, 1935, on a second charge of manslaughter in the first degree, the indictment alleging that Stern performed a criminal abortion on another Minneapolis girl, and that this girl died on March 30, 1935, as a result of the abortion. Stern was indicted on a third charge of manslaughter by the grand jury of Hennepin County on April 30, 1935, the indictment alleging that Stern had performed a criminal abortion on a young Minneapolis girl, and that this girl died on September 7, 1934, from the abortion. In a fourth indictment returned by the grand jury of Hennepin County on April 30, 1935, Stern was indicted on a charge of criminal abortion. Stern was placed on trial on April 27, 1936, on one of the indictments charging him with manslaughter. On May 1, 1936, the jury found him not guilty. The three remaining indictments against the defendant Stern in the District Court of Hennepin County, were nolle on August 19, 1937, upon recommendation of the County Attorney's office of that County.

The present case is the second one in which the state authorities have found Leunbach's Paste, a product of Merz & Company Chemical Works, Inc., Newark, New Jersey, being used by non-medical practitioners in the performing of criminal abortions. In the case of *State of Minnesota v. Herman V. Feenstra*, in August 1938, the Sheriff of McLeod County seized a quantity of Leunbach's Paste in the possession of the defendant who held no license to practice any form of healing in the State of Minnesota, but who claimed to be a South Dakota chiropractor. It would seem that the present case clearly indicates the danger of using this paste, and it is to be hoped that the State and Federal authorities will find a way to deal effectively with the sale of this product in the State of Minnesota.

The Minnesota State Board of Medical Examiners wishes to acknowledge the splendid work done in these cases by the St. Paul Police Department, and particularly by Mr. Charles J. Tierney, Assistant Chief of Police, Lieutenant Thomas Grace and Detective Frank Kennedy. The Medical Board also wishes to mention the splendid work done by Mr. James F. Lynch, County Attorney of Ramsey County, and Mr. Clarence R. Smith, County Attorney of Beltrami County.

Supreme Court of Minnesota Upholds Five-year Suspension of Lake City Physician's License

In re. Revocation of the License of
Gottfried Schmidt, M.D.

On May 17, 1940, the Supreme Court of Minnesota, in a unanimous opinion written by Justice Royal A. Stone, affirmed the District Court of Ramsey County, which Court had previously ruled that the order of the Minnesota State Board of Medical Examiners suspending Dr. Schmidt's license for a period of five years, "was neither arbitrary, oppressive nor unreasonable." The order of the District Court of Ramsey County was made by the Hon. Carlton McNally, Judge of that Court. Dr. Schmidt's license to practice medi-

cine was suspended by the Minnesota State Board of Medical Examiners on December 16, 1938, following a complaint having been made by a former patient to the Medical Board in respect to the manner in which Dr. Schmidt diagnosed and treated various ailments. This hearing brought out the fact that Dr. Schmidt attempted to diagnose ailments, such as, cancer, brain tumors, stomach ulcers and other serious ailments by having the patient moisten a piece of wood pulp paper with saliva. This piece of paper was then placed on the abdomen of the patient, or on the abdomen of a woman subject employed by Dr. Schmidt in his office at Lake City. It was also the claim of Dr. Schmidt that he had a machine in his office with which he could broadcast treatments to absent patients. Dr. Schmidt was twice warned by the Minnesota State Board of Medical Examiners to desist from such practices, but continued nevertheless.

Justice Stone in his opinion, after describing Dr. Schmidt's method of diagnosis, stated:

"That is enough, we think, to show why no judge, or any number of them, could say, judicially or otherwise, that the action of the board was without abundant foundation in the evidence. It cannot be otherwise until the methods of the aboriginal medicine man, the witch doctor, and voodooism are demonstrated to be superior to those of modern science as applied in the field of medicine. The board of seven competent doctors adhered to the notion that the accomplishments of bio-chemistry and microscopy, with their diagnostic disclosures (which, in many cases, go to the point of demonstration) are superior to quackery, ancient and modern. It is just impossible for a court to disagree with them."

Justice Stone's opinion described Dr. Schmidt's diagnostic methods as "so clearly bald quackery, and so much an imposition on his patients, that the testimony of three patients with whom he had good luck would not have helped him."

The records of the Medical Board show that Dr. Schmidt was born in Minnesota in 1871 and graduated in Medicine from the University of Minnesota in 1903. He has practiced at Lake City for the past twenty years.

SEROBACTERINS-MULFORD (SHARP & DOHME) OMITTED FROM N.N.R.

In 1914 and 1915 the Council on Pharmacy and Chemistry accepted certain of the "Serobacterins" which were manufactured by the H. K. Mulford Company, as follows: Acne Serobacterin-Mulford, Cholera Serobacterin-Mulford, Staphylo-Serobacterin-Mulford, Typho-Serobacterin-Mulford and Typho-Serobacterin Mixed-Mulford. At that time the Council did not authorize any claims of superiority over nonsensitized vaccine for these serobacterins. In 1937 Sharp & Dohme presented a booklet, "Advantages of Serobacterins in Bacterial Vaccine Therapy." In general the text gave the impression that "Serobacterins" are better than other well known prophylactic vaccines, that they have a wider field of application and that they offer a "degree of passive immunity during the period of lag or 'negative phase' which precedes the development of active immunity in the use of plain bacterial vaccines." The Council requested the firm to show evidence that the serobacterins were superior to ordinary vaccines and especially to show what clinical evidence existed to establish its claim for recent improvements. The firm requested that the report be held in abeyance pending accumulation of additional evidence. In September, 1938, the firm presented data which it stated would aid in the further evaluation of the usefulness of its serobacterins. The Council reported that the evidence does not favor continued recognition of the preparations by the Council. The Council therefore omitted from New and Nonofficial Remedies Acne Serobacterin-Mulford, Cholera Serobacterin-Mulford, Staphylo-Serobacterin-Mulford, Typho-Serobacterin-Mulford, and Typho-Serobacterin Mixed-Mulford, (Jour. A.M.A., April 13, 1940, p. 1453.)

In Memoriam

George N. Butchart

1872-1940

Dr. G. N. Butchart, a resident of Hibbing, Minnesota, since 1896, died at this home April 7, 1940, at the age of sixty-eight. He had been preceded in death by his wife about three months previously.

Dr. Butchart is survived by his son, Dana, of Hibbing and a daughter, Mrs. Gwenith Waldor of Minneapolis; two brothers, Peter C. Butchart of Edmonton and Robert F. Butchart of Greenburg, North Carolina, and three sisters, who live in western Canada, also survive.

Dr. Butchart received his medical degree from the University of Nebraska Medical College in 1895.

Dr. Butchart was born in County Gray, Canada, December 23, 1872. When four years of age he was taken by his family to North Carolina. Later he lived in Western Canada.

Louis Francis Kelling

1877-1940

Dr. L. F. Kelling, a practitioner at Lakefield, Minnesota, since 1919, died Saturday, April 6, 1940, at the age of sixty-four, after a few months' illness.

Dr. Kelling was born February 15, 1877 at New Liberty, Iowa. He attended high school at Tipton, Iowa, the medical school of the State University of Iowa for two years, and the Saint Louis College of Physicians and Surgeons for a year, where he graduated in 1898.

During the Spanish-American War Dr. Kelling served as a hospital steward with the 49th regiment of Iowa Infantry Volunteers for thirteen months. He practiced for four years at Lowden, Iowa and for fifteen years at Holstein, Iowa, before moving to Lakefield, Minnesota, in 1919.

Dr. Kelling was a member of the Southwestern Minnesota Medical Society, the Minnesota State and American Medical Associations. He was also a member of the Leon C. Brown Camp No. 26, U. S. Spanish war veterans, at Fairmont, Minnesota.

Dr. Kelling is survived by his widow, Jennie Johnson Kelling, and daughter, Betty Jane; also a brother, Dr. George Kelling of Waverly, Missouri, and the latter's son, Dr. Jordan Kelling.

Dennis J. McMahon

1869-1940

Dr. D. J. McMahon of Breckenridge, Minnesota, died on March 12, 1940 at the age of seventy.

Dr. McMahon was born at Prior Lake, March 28, 1869. He graduated from the College of Physicians

and Surgeons of Keokuk, Iowa, in 1894, and began practice in New Richmond, Wisconsin. He also practiced at Waseca and Raymond, Minnesota, before locating in Breckenridge in 1918.

Dr. McMahon was married to Katherine Mulcahy at Waseca in June, 1898.

While practicing at Raymond, Dr. McMahon served as postmaster for eight years. On moving to Breckenridge he began organizing the local Democratic party and served as chairman of the Wilkin County Democratic committee. He was appointed postmaster at Breckenridge by President Roosevelt but was forced to resign because of ill health. At times he served as county coroner and city health officer.

Dr. McMahon is survived by his widow, a son, Dr. Leo H. McMahon of Breckenridge and a daughter, Mildred, of Minneapolis.

Charles J. Plonske

1871-1940

Dr. Charles J. Plonske, president of the Rice County Medical Society and medical specialist in Faribault for twenty-three years, passed away at his home on May 16, 1940.

Dr. Plonske was born in Germany, March 15, 1871, and came to the United States as a child. He received his degree of Doctor of Medicine at the University of Illinois, after which he spent two years in postgraduate work in Vienna, Berlin and London, where he specialized in eye, ear, nose and throat study.

Following his return to this country, Dr. Plonske practiced in Minneapolis until 1917, when he was married to Marion Clarke of Minneapolis, and came to Faribault to establish a practice as specialist. He is survived by his widow and one daughter, Miss Marion Plonske.

At the time of his death, he was a member of the state and national medical associations, and was president of the Rice County Medical Society. He was a member of the staff of the St. Lucas Hospital, a member of the Masonic Lodge No. 9, A.F. and A.M., a member of Zuhrah Temple, Minneapolis, Nobles of the Mystic Shrine and a 32nd degree Mason.

He was the eye, ear, nose and throat specialist for the State School for the Deaf and the State School for the Feeble-minded located at Faribault, Minnesota.

Thomas Tweed Warham

1866-1940

Dr. Thomas Tweed Warham was born August 31, 1866 in Kingston, Ontario, the son of Richard Lee and Agnes Warham. His high school education was obtained in Ontario. Upon coming to Minneapolis he attended the Minneapolis Academy before entering the medical department of Hamline University, where he

was graduated in 1897, receiving the degrees of M.D. and C.M.

He began his medical practice in Vernon Center, Minnesota, coming later to Minneapolis in 1904 where he remained until his death.

Dr. Warham was appointed medical inspector for the Health Department in 1907, a position he held until 1915. He was County Physician for about twenty years, the last period being from 1928 to 1940. He was a member of the staffs of St. Mary's and Asbury Hospitals, which two institutions he served loyally throughout the years. He was a member of the Minnesota State Medical Association, the Hennepin County Medical Society, and the American Medical Association. Fraternally, he was a member of the Sons of Veterans, I.O.O.F., Elks, Eagles, Modern Woodmen, Foresters, Moose, Evergreen Club, and his Masonic affiliations were: first Master of Joppa Lodge, AF&AM, Scottish Rite, and a life member of Zurah Temple of Shriners. He was a Presbyterian by faith.

He was unmarried. He died March 27, 1940 at the age of seventy-four years and is survived by two sisters, Mrs. Maud Hale and Mrs. Jennie Cornish, and a brother, Harry, all of Minneapolis.

Dr. Warham represented the true type of family physician that is frequently lauded in public meetings and not always appreciated in private practice. He examined his patients carefully and gave them an almost brotherly care. Those who were close to him in his professional life appreciated how he gave of himself to his work without stint and regardless of remuneration.

CLAUDE C. KENNEDY

Charles Benjamin Wright

1876-1940

Dr. Charles Benjamin Wright, a trustee of the American Medical Association and for many years one of the outstanding men of Internal Medicine in Minneapolis and Minnesota, died at Northwestern Hospital after an illness of several weeks, on May 31, 1940.

Dr. Wright was born in Kemptville, Ontario, Canada, November 3, 1876. He received his A.B. degree at the University of North Dakota (Phi Beta Kappa) and his M.D. degree at the Johns Hopkins Medical School in 1902. After serving an internship of one year at the Johns Hopkins Hospital he engaged in general practice in Minneapolis for a period of ten years. The years of 1913-1914 were devoted to post-graduate work in Vienna. He then returned to Minne-

apolis and since that time had confined his practice to Internal Medicine.

Dr. Wright had written several important papers. The most recent one on "Hodgkin's Disease" was presented at the eighty-ninth annual session of the American Medical Association at San Francisco, June 14, 1938.

During the First World War he served on the State Advisory Draft Board and afterward on the Medical Advisory Committee of the National Rehabilitation Committee of the American Legion. He was a member of St. Mark's Church, the Minneapolis Club, the Automobile Club, the Six O'clock Club, and the Lake Shore Athletic Club of Chicago.

Dr. Wright was a member of the Alpha Kappa Kappa medical fraternity, the Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association, the American Therapeutic Society, the Central Society of Clinical Research, Minnesota Society of Internal Medicine and the Minnesota Pathological Society; a Fellow of the American College of Physicians, the Minnesota Academy of Medicine and a Diplomate of the American Board of Internal Medicine. He was also a member of the staff of Northwestern and Swedish Hospitals and a member of the Executive Committee of the Minnesota Public Health Association.

Dr. Wright contributed in a large way to the advancement of medicine locally and nationally. At the University of Minnesota he served as Clinical Professor of Medicine. He was president of the Hennepin County Medical Society in 1924 and of the Minnesota State Medical Association in 1928. He completed one term, 1933-1938, as a trustee of the American Medical Association and was serving a second term in that capacity at the time of his death. He was appointed member of the Editing and Publishing Committee of MINNESOTA MEDICINE in November, 1935, to fill the vacancy occasioned by the illness of Dr. A. S. Hamilton. He was also a member of the board of trustees of the National Physicians Committee for the Extension of Medical Care. He rendered valuable service as chairman of the Legislative Committee of the Hennepin County Medical Society and in April, 1940, was awarded the distinguished service medal by the Minnesota State Medical Association.

Dr. Wright, by his qualities of leadership, his sincerity of purpose, his unswerving devotion to his clientele and to the cause of medicine, won the sincere admiration of his patients and the medical profession.

Dr. Wright is survived by his wife, Alma Hanson Wright; two sons, Charles B., Jr., and Thomas; and a daughter, Helen, all of Minneapolis.

GEORGE R. DUNN.

OF GENERAL INTEREST

Dr. Royal C. Gray, assistant clinical professor of nervous and mental diseases at the University of Minnesota, has been elected a member of the American Psychiatric Association.

* * *

Attending the meeting of the Association of American Physicians in Atlantic City, May 7 and 8, were Drs. N. M. Keith, C. H. Watkins, W. M. Boothby, E. C. Kendall and W. S. Lemon of Rochester.

* * *

Dr. F. H. Magney, Duluth, was elected president of the State Board of Medical Examiners at the annual meeting of the Board. Dr. Albert Fritsche of New Ulm is the new vice president and Dr. J. F. Du Bois of Sauk Center was re-elected as secretary.

* * *

Dr. Charles E. Rea, assistant professor of surgery at the University of Minnesota Medical School for the past two years, will enter private practice in Saint Paul, July 1, establishing offices at 917 Lowry Building. He will continue on the University teaching staff.

* * *

Appointment of Dr. Frederick W. Hoffbauer, medical fellow in the University of Minnesota Department of Medicine, as physician on the staff of Health Service, is announced. The appointment will be in effect September 16, 1940.

* * *

Dr. Russell Heim has been named Hennepin County physician by the county commissioners. He fills the vacancy created by the death of Dr. Thomas T. Warham. As county physician, he is the medical officer of all county institutions except Glen Lake Sanatorium.

* * *

Dr. Joseph Berkson of Rochester attended a conference of consultants of the United States Public Health Service in Washington, D. C., on May 15 and 16. The conference was concerned with the forthcoming National List for Morbidity Reporting.

* * *

Dr. Walter M. Boothby of Rochester visited hospitals in Toronto and London, Ontario, Canada during the week of May 13. He also took part in the post-graduate course sponsored by the medical faculty of the University of Western Ontario.

* * *

The Society of Neurological Surgery re-elected Dr. Winchell McK. Craig of Rochester as secretary-treasury at its national meeting in St. Louis, May 9. Dr. Craig is also vice president of the Harvey Cushing Society which met recently in Kansas City.

* * *

Dr. J. T. Priestley of Rochester addressed the Medical Society of the State of New York in New York City, May 8. Dr. Frank J. Heck of Rochester spoke at the Texas State Medical Association meeting held in Dallas, May 14-16.

In Kansas City, May 16-18, for a regional meeting of the American Academy of Pediatrics were Drs. L. F. Richdort, C. A. Stewart, E. J. Huenekens, D. M. Siperstein, A. Moss, F. C. Rodda and R. L. Wilder of Minneapolis.

* * *

The faculty of the University of Minnesota Medical School had a good time lampooning itself at the annual meeting of the Medical Six-O'Clock Club recently. The club is an old institution on the campus, which has been under the wing of Incas, honorary medical society.

* * *

An imposter using the name of Dr. Youbert Theodore Johnson of Minneapolis is reported to be calling on southern Minnesota physicians in an attempt to float personal loans. Physicians are asked to be on the watch-out for the man who presents a business card bearing the name of Dr. Johnson.

* * *

Dr. Harold S. Diehl, dean of Medical Sciences at the University of Minnesota, and Dr. Gaylord W. Anderson, also of the University medical faculty, participated in Surgeon-General Thomas Parran's annual public health conference in Washington, D. C. during the week of May 6.

* * *

To provide a more adequate teaching staff for laboratory work, the University of Minnesota has increased the fees for the medical technology course in the Medical School. Fees for resident students are now \$40 a quarter, instead of \$30; for non-resident students, \$60 instead of \$45.

* * *

Dr. Frank Adair, Saint Paul, was married May 1, 1940, to Miss Dorothy Andrews of Grand Rapids, Minnesota. Dr. James McMillan of New York acted as best man at the wedding and among the ushers were Dr. Thomas Thompson of Nashville and Dr. James Hammermill of Saint Paul.

* * *

Dr. Charles E. McLennan of the Department of Obstetrics and Gynecology, University of Minnesota Medical School, has been awarded a Fellowship by the Commonwealth Fund for a year's study with Dr. E. M. Landis of the University of Virginia on problems concerning the toxemias of pregnancy.

* * *

Dr. A. E. Osterberg of Rochester attended a meeting of the Committee for Chemical Service to Medicine of the American Chemical Society in New York, May 8. He also attended the Convention for the Revision of the Pharmacopœia of the United States of America as delegate from the Minnesota State Medical Association.

Seventy-nine persons from fifty-seven institutions attended the course in Health Problems of College Students held at the Center for Continuation Study, University of Minnesota, May 2, 3 and 4. Twelve states were represented—Colorado, Illinois, Iowa, Kansas, Minnesota, Missouri, Montana, New Hampshire, North Dakota, South Dakota, Utah, and Wisconsin.

* * *

A pictorial feature on the new laboratories of physiological hygiene at the University of Minnesota appeared in the May 13 issue of *Life* magazine. The article described the work of Dr. Ancel Keys in measurements of chemistry and physics of athletes' bodies in action. There were several pictures of the exercise laboratory.

* * *

Dr. A. G. Liedloff was re-named chairman of the Public Health Nursing Association of Blue Earth County at its annual meeting, May 14, in Mankato. Speakers at the annual meeting included Dr. Eric K. Clarke of Minneapolis, director of the University Psychiatric Clinic for Children, and Dr. Robert Barr of the State Department of Health.

* * *

Among the thirteen new fellows in the Mayo Foundation are Dr. Rolf M. Iverson of Houston, Minnesota; Dr. H. Penn Harper of Detroit, Michigan who received his M.D. from the University of Minnesota in 1936; and Dr. William W. Wood Jr. of Jamestown, North Dakota, who received his M.D. from the University of Minnesota in 1937.

* * *

The annual dinner of the Minnesota Medical Alumni Association at the A.M.A. meeting in New York will be held at 6 p. m. Wednesday, June 12, at the Brauhaus Restaurant, 207 E. 54th Street. Price of the dinner will be two dollars. Reservations may be sent to Dr. Louis A. Hauser, chairman of arrangements. He is being assisted by Drs. Orville Chancellor, Ernest W. Lampe, John A. Timm and L. S. Ylvisaker.

* * *

Notes from the University of Minnesota department of obstetrics and gynecology: As a coöperative project with the Minnesota Department of Health, the department is conducting a teaching Home Delivery services, to give medical students experience in home deliveries. . . . The department has a new map showing the residence of patients in Minnesota with carcinoma of the cervix.

* * *

Among physicians included on the program for the three-day Medical, Hospital and Institutional Library Service conference at the University of Minnesota Center for Continuation Study, May 22, 23 and 24, were: Dr. Carl C. Chatterton of the Gillette State Hospital for Crippled Children; Dr. Gordon R. Kamman of St. Paul, and Dr. Frank J. Hirschboeck of Duluth.

* * *

Three men closely associated with medicine are members of committees concerned with the selection of a president of the University of Minnesota. On

the Board of Regents' selection committee are Dr. E. E. Novak of New Prague and Albert J. Lobb, Mayo Clinic executive staff. On the faculty committee to advise and consult with the regents' committee is Dr. J. Charnley McKinley of Minneapolis.

* * *

A group of members of the Minnesota State Medical Association spoke before the recent Minnesota Conference of Social Workers in Minneapolis. They were Dr. H. E. Hilleboe and Dr. George Earl of Saint Paul, Dr. W. W. Will of Bertha, Dr. E. J. Simons of Swanville, Dr. W. A. O'Brien of Minneapolis. Raymond M. Amberg, superintendent of the University Hospitals, also spoke.

* * *

Dr. L. A. Buie of Rochester spoke at a meeting of the Missouri State Medical Association in Joplin, April 29, and at a meeting of the South Carolina Medical Association in Charleston, May 2. His topic for these meetings was "Office and Hospital Management of Some Anorectal Disorders." On May 3, he delivered an address at the University of South Carolina in Columbia on "Unceasing world war—the outline of man's struggle against disease."

* * *

Dr. Theodore C. Blegen has been named dean of the University of Minnesota Graduate School. Now on leave of absence from the University where he is professor of history, Dr. Blegen is engaged in research on a fellowship of the Norwegian-American Historical Association. He was formerly superintendent of the Minnesota State Historical Society. The post of dean of the graduate school has been vacant since the death of Dr. Royal C. Chapman last winter.

* * *

To report for war-time medical service in their countries, three physicians, who recently began their fellowships in the Mayo Foundation, have taken leaves of absence.

Dr. H. B. Alexander of Dunedin, New Zealand, and Dr. A. Y. Mason of Johannesburg, South Africa, have gone to England. Both are reserve officers.

Dr. T. Guthe, a native of Oslo, Norway, also sailed for England about the first of May. Mrs. Guthe will remain in the United States.

* * *

Eleven Minnesota men took part in the program of the fifty-ninth annual session of the South Dakota State Medical association in Watertown, May 20, 21 and 22.

They were Dr. Russell J. Moe of Duluth; Drs. Robert G. Allison, Raymond N. Bieter, William A. O'Brien, Charles Spratt, Albert V. Stoesser and L. H. Winer of Minneapolis; Drs. Louis A. Brunsting, William F. Braasch, John M. Waugh, and Ralph K. Ghormley of Rochester.

* * *

Dr. L. G. Rigler, professor of radiology in the University of Minnesota Medical School, addressed the American Society of X-Ray Technicians, May 30,

at its meeting in Memphis. His topic was "The American Registry of X-Ray Technicians."

He also spoke at the Meharry Medical College in Nashville, June 1, before attending meetings of the National Tuberculosis Association and the American Association for Thoracic Surgery in Cleveland, and the American Medical Association in New York City.

* * *

The St. Louis County Sanatorium Commission dedicated its new unit at Nopeming, Sunday, May 12. Speaker was Dr. Malcolm T. MacEachern, associate director of the American College of Surgeons.

Other Duluth hospitals coöperating in the celebration were St. Luke's, St. Mary's, Miller, Webber and Heard.

The new unit at Nopeming has been finished under the direction of Paul H. Fesler, former University of Minnesota Hospitals superintendent.

* * *

Among speakers at the eleventh annual Vocational Guidance Conference of Carleton College in Northfield, April 10, was Dr. Paul C. Benton of Gibbon. In a panel discussion for the professional group, Dr. Benton discussed opportunities offered by the various branches of the medical sciences, and the qualifications necessary for success in each of these fields. This was followed by a round-table discussion on medicine, in which Dr. Benton reviewed problems confronting the graduate who chooses the general practice of medicine as a career, and the rewards, moral and financial, awaiting those who succeed.

* * *

Dr. Nellie N. Barsness of Saint Paul is the new president of the Minnesota Medical Women's Association, succeeding Dr. Della G. Drips of Rochester who was hostess to the group at a luncheon during the recent meeting of the Minnesota State Medical Association.

Dr. Elizabeth Woodworth of Minneapolis is secretary-treasurer of the organization.

Dr. Barsness will attend the national convention of the American Medical Women's Association to be held in New York City, June 9 and 10, in conjunction with the meeting of the American Medical Association. Dr. Barsness, as a branch president, will be among the honored guests at a luncheon, June 9.

* * *

When the American Board of Pediatrics and the Society for Pediatric Research met in Skytop, Pennsylvania, during the first week of May, there were several papers by Minnesota Men. Dr. Arild E. Hansen of the University of Minnesota Medical School gave a paper on "The Study of Serums and Tissue Lipids in Generalized Lipodystrophy (Lipohistioidi-*resis*)," prepared by himself and Dr. Irvine McQuarrie. Dr. H. F. Helmholz of Rochester had for the subject of his address before the board, "Differential bactericidal effects of various urinary antiseptics."

Addressing the Society for Pediatrics Research were Dr. John A. Anderson and Dr. A. V. Stoesser of the University of Minnesota, and Dr. R. L. J. Kennedy of Rochester.

Dr. Hansen was elected vice president of the Society.

Several Minnesota physicians were among the speakers at the fifty-third annual meeting of the North Dakota State Medical Association held in Minot, May 6, 7 and 8.

Taking part in a symposium on "Essential Hypertension" were Dr. Walter Camp of the University Medical School and Dr. Charles N. Hensel of St. Paul.

Dr. R. C. Webb of the University Medical school spoke on "Hernia"; Dr. Paul A. O'Leary of Rochester on "The Eczemas"; Dr. Chester A. Stewart of the Medical school on "Convulsive Disorders in Children"; Dr. M. C. Piper of Rochester on "Chronic Infections of External Genitalia"; Dr. A. W. Adson of Rochester on "Early Skull Fractures"; Dr. John L. McKelvey on "Vascular Disease as Related to the Pregnancy Toxemias," and Dr. F. E. Foley on "The Choice of Operation for Bladder Neck Obstruction." The latter two are also associated with the University of Minnesota Medical School.

* * *

University of Minnesota medical school administrators with medical school heads throughout the country, have plunged into the task of organizing the nation's medical resources for a "national emergency."

Dr. Harold S. Diehl, dean of medical sciences at the University of Minnesota, has been authorized to form "United States General Hospital No. 26" at the University. This is the same number the Minnesota base hospital unit had during the World War. The hospital unit, in event of war, would be under orders from the United States surgeon general for service in any zone he might designate.

A typical unit, such as to be organized at the University, would have a basic personnel of about 40 persons, including 20 surgeons, seven medical service physicians, two dentistry service physicians, an x-ray specialist, a laboratory man, commanding officer, executive officer, quartermaster, and six men from the army's administrative reserve. In addition, the staff would be supplemented by several hundred enlisted men and nurses.

* * *

Dr. C. L. Scofield of Benson recently marked two major anniversaries. One was his 75th birth anniversary (April 16); the other, the fiftieth (March 1) of his coming to Benson to start a medical practice which has taken him into important work in public health and civic leadership.

With many years of practice as a family doctor, Dr. Scofield first stepped into state-wide medical activity in 1906, as one of the organizers of the state sanitary conference. A year later he became a member of the society for the study of prevention of tuberculosis, subsequently the Minnesota Public Health association of which he was president from 1919-1923.

He has served twelve years on the state board of health, four years as president; has been a member of the state tuberculosis advisory commission, and chairman of the Swift County Public Health association.

Long active in Benson civic affairs, Dr. Scofield was president of the village council in 1897, and is known as the father of the Benson park system.

The Scientific Exhibit at the A.M.A. meeting will include the work of several Minnesotans.

Dr. V. L. Hart of Minneapolis will take part in the demonstration of an exhibit on fractures.

In connection with the exhibits of the section on dermatology and syphilology, there will be motion pictures by Dr. L. A. Brunsting of Rochester, and also by Dr. C. W. Laymon of Minneapolis.

Other exhibits in the various sections will be by: Drs. R. K. Ghormley, E. F. Rosenberg and P. S. Hench of Rochester, section on orthopedic surgery; Drs. Lundy, Mousel, R. C. Adams and E. B. Tuohy of Rochester, anesthesia; Dr. L. E. Prickman and Dr. H. J. Moersch, section on practice of medicine; Dr. Comfort and Dr. Arnold E. Osterberg, section on practice of medicine; Dr. S. W. Harrington, section on surgery; Dr. A. H. Bulbulian, section on surgery.

Drs. Wakefield and Friedell will have an exhibit in the section on gastro-enterology and proctology, as will Drs. A. H. Logan, P. W. Brown, J. A. Bargaen, H. M. Weber, L. A. Buie, H. H. Bowing, A. H. Baggenstoss, C. F. Dixon, J. de J. Pemberton and C. W. Mayo.

Motion pictures will be shown in the section on nervous and mental diseases by Dr. B. T. Horton and Dr. G. M. Roth; and by Dr. C. H. Sheldon and Henry W. Woltman.

* * *

When the American Psychiatric Association held its ninety-sixth annual meeting in Cincinnati, May 20-24, Dr. Reynold A. Jensen of the University of Minnesota Psychiatric Clinic for Children read a paper prepared by himself and Dr. Eric K. Clarke, director, entitled "The Integration of Psychiatric Teaching with Pediatrics."

Participating in the meeting besides Drs. Jensen and Clarke were Dr. Burtrum C. Schiele, also of the University of Minnesota, who presented a paper, "A Clinical Study of Sleep Disturbances"; Dr. Nathaniel J. Berkwitz of Minneapolis who discussed "New Developments in Pharmacological Shock Therapy"; Dr. Herman E. Hilleboe of Saint Paul who discussed a paper on clinical tuberculosis in light of a recent survey of tuberculosis patients in Minnesota state hospitals.

* * *

With the close of the spring quarter, the staff of the Hospitals of the University of Minnesota completes its eleventh year of weekly staff meetings.

Held each Friday noon during the school year, the meetings are attended by members of the staff, fellows and internes. Attendance averages approximately 150 persons. Luncheon at 11:45 a.m. (sandwiches, pie and beverage served "on the house") is followed at 12:15 p.m. by an entertaining non-medical film, and that by the weekly scientific paper and discussion. The program is arranged so that each department contributes a paper to the scientific program during the year.

These papers are published in full in a mimeographed bulletin, prepared under the direction of Dr. W. A. O'Brien, chairman of the staff meetings. The bulletin is distributed at the close of the meeting. A page of

announcements and a much-read gossip column are included each week in this staff meeting bulletin.

* * *

Scheduled to appear on the program of the American Medical Association meeting in New York City, June 10-14, are a large number of Minnesota physicians.

Two will serve as chairmen of sections. Dr. Harold S. Diehl, dean of Medical Sciences at the University of Minnesota, will be chairman of the section of preventive and industrial medicine and public health, and Dr. Frederic E. B. Foley of Saint Paul will serve as chairman of the section on urology. Both will give papers.

Others from the Twin Cities who will present papers are Dr. Erling S. Platou, Dr. J. Arthur Myers, Dr. Ruth E. Boynton and Dr. L. H. Winer of Minneapolis and Dr. John F. Madden of St. Paul. Taking part in the discussion of the section on orthopedic surgery will be Dr. Myron O. Henry of Minneapolis.

Dr. F. T. Becker of Duluth will deliver a talk before the section on dermatology and syphilology.

Two Rochester men are secretaries of sections: Dr. J. A. Bargaen, section on gastro-enterology and proctology, and Dr. Edgar V. Allen, section on pharmacology and therapeutics.

Others from Rochester scheduled to give scientific lectures are Drs. Walter C. Alvarez, B. T. Horton, F. A. Willius, J. P. English, W. E. Herrell, Harold I. Lillie, F. P. Moersch, A. E. Brown, Howard K. Gray, W. L. Benedict, F. A. Figi, A. R. MacLean, H. E. Robertson, J. L. Bollman, W. F. Braasch, V. S. Counsellor, E. N. Cook, M. S. Henderson, E. G. Wakefield, M. T. Friedell, M. W. Comfort, E. T. Leddy, H. J. Moersch and Lloyd H. Mousel.

Programmed to take part in discussions are Drs. Allen, L. M. Randall, Gordon B. New, Paul O'Leary, E. J. Keppler, Hamilton Montgomery, Ralph K. Ghormley, C. Allen Good, Jr. and John S. Lundy.

MINNESOTA HOSPITAL ASSOCIATION

Miss Esther Wolfe, superintendent of St. Andrews Hospital in Minneapolis, was named president-elect of the Minnesota Hospital Association when that group conducted its seventeenth annual convention in Minneapolis, May 23-25.

Others elected to take office next year are Dr. Walter P. Gardner of Anoka, first vice president; Miss Eda Kamrath of Hutchinson, second vice president; Emil M. Hauge, Fairview Hospital in Minneapolis, treasurer.

Dr. A. F. Branton of Willmar, administrator of the Willmar hospital, is the association's executive secretary.

There were more than 400 registrations for the 3-day convention, at which Dr. Fred Carter of St. Luke's hospital in Cleveland was principal speaker.

A. G. Stasel, Eitel hospital in Minneapolis, retiring president, presided at the sessions. Raymond Amberg, University of Minnesota Hospital, who was named president-elect a year ago, assumed his duties as head of the association.

MEDICAL BROADCAST FOR JUNE

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters), and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

- June 1—What is Diabetes?
- June 8—Management of Diabetes in Children.
- June 15—Management of Diabetes in Adults.
- June 22—The Outlook in Diabetes.
- June 29—Stomatitis.

ABBOTT LABORATORIES FELLOWSHIPS IN CHEMISTRY

For the academic year 1940-41, Abbott Laboratories has established fellowships in several universities with important departments of organic chemistry and biochemistry. The fellowships, carrying stipends of \$650 per year, will be available to graduated students in the last or next to last years of graduate work leading to the doctorate degree. The recipients, who are to be selected by the universities in which their work is being done, are not limited as to the subjects on which they will work.

The object of the fellowships is to provide means for the carrying on of additional scientific work in American universities. The future progress of chemical developments in this country will depend upon the availability of well-trained and qualified men, and it is the intent of Abbott Laboratories in establishing these fellowships to lend encouragement in these general fields.

Grants will be made in organic chemistry to Cornell, Harvard, Illinois, and Michigan; in biochemistry to California, Columbia, and Cornell.

DEDICATION OF OSLER MEMORIAL TO BE HELD AT BLOCKLEY

The old autopsy house where Osler worked at Blockley has been restored as the Osler Memorial Building, and will be dedicated on the grounds of the Philadelphia General Hospital, at Curie Avenue, near 34th and Pine Streets, Philadelphia, Pa., at 2 P.M. on June 8, 1940.

Original furnishings, including the necropsy table, have been collected. The painting by Dean Cornwell, N.A., of New York, entitled "Osler at Old Blockley," later to be hung in the building will be on exhibition during the celebration.

There are facilities in the building for the housing and preservation of relics of old Blockley, as well as

Osleriana. The Committee would welcome any additions to this collection.

A cordial invitation is extended to those who are interested, and especially those who are planning to attend the American Medical Association Convention in New York City June 10th to 14th.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The 19th annual scientific and clinical session of the American Congress of Physical Therapy will be held September 2, 3, 4, 5, and 6, 1940, at the Hotel Statler, Cleveland, Ohio.

The mornings will be devoted to the annual instruction course, enabling attendance at both the course and scientific sessions which will be given in the afternoons and evenings. This will minimize the time element and permit attendance at both functions during the same week. The seminar and convention proper will be open to physicians and qualified technicians.

For information concerning the seminar and preliminary program of the convention proper, address American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

HENNEPIN COUNTY SOCIETY

Dr. Russell W. Morse is the newly elected president of the Hennepin County Medical Society. With other recently named officers, he will take office at the annual meeting of the organization next October.

Dr. C. A. McKinlay was chosen first vice president, and Dr. Kenneth Phelps, second vice president. Dr. James K. Anderson and Dr. Paul F. Dwan were elected to the executive committee. Dr. James A. Johnson will retire as president next autumn to become chairman of this committee.

Named on various elective committees and boards were: Board of Censors, Dr. Donald McCarthy and Ivar Sivertsen; Board of Trustees, Drs. Martin Nordland and James S. Reynolds; Ethics Committee, Drs. R. R. Cranmer and Willard D. White.

Delegates to the Minnesota State Medical Association are: three-year term, Drs. H. F. Bayard, J. M. Hayes, Douglas P. Head and C. O. Maland; two-year term, Drs. S. H. Baxter and H. B. Sweetser, Jr.; one-year term, Dr. John E. Hynes.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

Twenty-five members of the Minnesota Society of Neurology and Psychiatry attended a scientific program in Rochester, May 11.

The morning program at St. Mary's hospital was followed by a luncheon at the Mayo Foundation House, the guest speaker being Dr. Peter Bassoe of Chicago. His topic was "Some Neuropsychiatric Observations in Mexico, Puerto-Rico and the Virgin Islands."

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Arrangements for the meeting of the Northern Minnesota Medical Society to be held in Duluth, July 19 and 20, are being completed under the direction of the following committee chairmen:

General ChairmanDr. F. J. Elias
Place of Meeting.....Drs. Richard Bardon and E. Barrett
RegistrationDr. Gordon MacRae
BanquetDrs. F. H. Magney and Phil Bray
Entertainment.....Drs. R. J. Moe, W. Graves, and A. J. Spang
Hotel and Transportation.....Dr. T. G. Clement

The committees appointed by Mrs. Thomas O. Young, president of the St. Louis County Auxiliary, are as follows:

Transportation.....Mrs. P. S. Rudie
Entertainment.....Mrs. R. S. Forbes
Registration.....Mrs. W. A. Coventry

The papers obtained so far for the meeting include the following:

Disturbances of Peripheral Circulation—
E. V. Allen, Rochester
Coronary Disease—
Jay Davis, Minneapolis
Gout, the Forgotten Disease—
E. L. Tuohy, Duluth
Subject not yet announced—
L. A. Buie, Rochester
Treatment and Results in Appendicitis—
R. H. Mueller, Two Harbors
A Report on Progress in Adrenal Therapy—
J. L. McLeod, Grand Rapids
Practical Points in Female Sex Hormone Therapy—
J. R. Manley, Duluth
Presentation of two Unusual Cases, (1) Amyloidosis
(2) Hypoparathyroidism with Bone Changes—
R. O. Sather, Crookston
Pathology in the Bronchi and Esophagus: A Clinical
and Endoscopic Study of Recent Cases—
Virgil J. Schwartz, Minneapolis

Papers accepted, but title not yet presented include one by H. A. Chesley, Health Department, University of Minnesota and another on a urologic subject by Wm. Elliott, Virginia, Minnesota.

On July 19, the following physicians will present cases in the form of clinical presentations under the direction of Drs. W. D. Coventry and S. H. Boyer, Jr.:

Karl W. Emanuel—Congenital Hemolytic Icterus.
J. R. Kuth—Report of a Case of Spinal Block.
W. E. Hatch—Urological Demonstration.
M. G. Gillespie—A Case Report of a Carcinomatous Ulcer of the Stomach.
D. W. Wheeler—Chronic Fibrosing Pneumonia.
Chas. Mcad—Abscess of the Tongue.
Anderson Hilding—Experimental Sinus Surgery and its Significance.

R. E. Nutting—Some of the Newer Therapeutic Procedures in Pediatrics.

P. N. Bray—Roentgenographic Diagnosis of Pregnancy.
P. G. Boman—Acute Suprarenal Failure.

Dr. C. H. Schroder will be toastmaster for the banquet. Dr. O. W. Parker will give an address, and one other speaker not yet engaged.

Dr. F. J. Hirschboeck is Program Chairman.

MINNEAPOLIS SURGICAL SOCIETY

Dr. James A. Johnson is the new president of the Minneapolis Surgical Society. Other officers named recently are Dr. Arthur Bratrud, vice president; Dr. R. F. McGandy, secretary-treasurer.

Others on the Council besides the officers are Dr. Willard D. White, retiring president; Dr. William Hanson, Dr. H. O. McPheeters, Dr. Daniel McDonald, Dr. R. C. Webb and Dr. Richard Cranmer.

The Society has recessed for the summer and will resume its meetings next October.

MINNESOTA MENTAL HYGIENE SOCIETY

The first annual meeting of the Minnesota Mental Hygiene Society was conducted in Minneapolis, May 8, with Dr. David Slight, professor of psychiatry at the University of Chicago, as principal speaker.

Directors were elected, Dr. H. M. Keith of Rochester, Mrs. Stella Amass of Saint Paul, Miss Elizabeth Glynn and Dr. Alex Blumstein of Minneapolis being renamed. Others elected were Mrs. Angus Morrison of Wayzata, Dr. L. R. Gowan of Duluth, Miss Ruth Ferguson of Stillwater and Ralph Helstein of Minneapolis.

These directors, together with other members of the Board, will meet June 5 to elect officers. Present officers are Dr. Keith, president; Mrs. Amaas, vice president; Miss Glynn, secretary; Stanley Hedstrom of Saint Paul, treasurer.

OLMSTED-HOUSTON- FILLMORE-DODGE SOCIETY

Twenty-one new members were elected to the Olmsted-Houston-Fillmore-Dodge County Medical Society at a meeting in Rochester, May 1.

Held in conjunction with a meeting of the Mayo Clinic general staff, the session included a scientific program, over which Dr. C. E. Bigelow of Dodge Center, vice president, presided.

New members elected to membership are: Drs. Bruce M. Anderson, William J. Brackwell, J. W. Burks, Joseph R. Campbell, Franklin F. Ferguson, Robert F. Golden, J. M. Ivie, Charles E. Jacobson, Jr., M. P. Kelsey, Robert M. Kent, Henry J. Lehnhoff, Jr., C. H. McCall, William C. MacCarty, Jr., J. R. Miller, Jr., R. M. Meale, E. D. Quick, George P. Sayre, Richard M. Shick, Gordon W. Strom, R. E. Van Demark and Wilson Weisel.

REDWOOD-BROWN COUNTY SOCIETY

The annual meeting of the Redwood-Brown County Medical Society was held Tuesday evening, May 14, at New Ulm, preceded by a joint dinner with the Auxiliary. Dr. Francis Lynch of Saint Paul talked on "Fungus Infection."

The following officers were elected: President, Dr. H. E. Mortensbach, Hanska; Vice President, Dr. E. J. Wohlrabe, Springfield; Secretary-Treasurer, Dr. O. B. Fesenmaier, New Ulm; Censor to 1943, Dr. F. J. Pelant, New Ulm; Delegate, Dr. O. J. Seifert, New Ulm.

SOCIETY FOR RESEARCH ON CONVULSIVE DISORDERS

A Society for Research on Convulsive Disorders has been organized with the approval of the executive board of the Minnesota State Medical Association. Goal of the Society is primarily one of creating interest and of collecting funds for the advancement of research in this field. It is planned that funds collected by the society will be given to the Minnesota Medical Foundation to be devoted to specified research projects.

There are four classes of membership: active (\$5 a year), contributing (at least \$1.50 a year), sustaining (trust fund in any amount in excess of annual dues of active members), and honorary.

Mrs. H. H. Creamer of Minneapolis is president of the Society; W. A. Gordon of Saint Paul, vice president. James Norton, 823 22nd Avenue South, Minneapolis, is secretary.

The Board includes M. E. Souther and Dr. Gordon R. Kamman of Saint Paul; Dr. H. W. Woltman of Rochester; Dr. D. E. McBroom of Cambridge; Dr. Charles G. Ferrari, Dr. W. A. O'Brien, Dr. Irvine McQuarrie and Vincent Johnson of Minneapolis.

WASHINGTON COUNTY SOCIETY

The regular monthly meeting of the Washington County Medical Society was held at the Stillwater Club rooms on May 14, 1940. The special feature was a dinner given by the Society to the doctors who had lectured to the society during the year and in appreciation thereof. As the weather was pretty soggy none of the guests tore up the turf on the fine and beautifully located Stillwater Golf Course; golf was to have been the feature and bait of the entertainment.

After the dinner, stories and gossiping, members and guests returned to the realities of this mundane sphere, and Dr. Frank Savage gave a résumé of the activities of the Minute-men of American Medicine and of the National Physicians' Committee for the Extension of Medical Service and Free Enterprise in Medicine. This was illustrated by lantern slides. As the time became limited, Dr. E. V. Strand's report on the Obstetrics Course given at the University of Minnesota (which he had reviewed before the staff of the Lakeview Memorial Hospital on May 3) was put off until the September meeting. Dr. E. M. Jones spoke on some features of the Rochester meeting, as did Dr. Humphrey, who also reported on the Milk Ordinance before the City Council. The second reading of this was put off until June, as the opposition is quite strong, and the Council wanted more time for study of the several objections.

Dr. E. S. Boleyn reported that the State Society requested, through its proper committee, greater activities in immunization, which should be pushed effectively now and in the future without any let-up. A committee was appointed to establish inter-professional contacts and to arrange for a meeting or meetings as soon as practical.

E. SYDNEY BOLEYN, M.D., *Secretary*.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*

MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

State Meeting

The 18th annual meeting of the Women's Auxiliary to the Minnesota State Medical Association was held in Rochester, Minnesota, April 22, 23 and 24. It was not only exceedingly well attended but was most successful from every point of view. The wonderful hospitality of the Rochester members made every minute's stay in the city most enjoyable and the pleasant memories will linger long with those who had the opportunity of attending. The various reports showed well that the past year has found the Women's Auxiliary throughout the state actively engaged in various health projects and in promoting better understanding between other organizations and groups.

It was most inspiring to have the national president, Mrs. Rollo Packard, at the opening meeting which took place Monday, April 22, at 10:30 at the Mayo Foundation House. Her talk, which was given at the luncheon following this board meeting, gave us a splendid picture of what physicians' wives could do in the future, and the need for continued study and work in carrying out the aims of the Medical Association. A delightful tea was given that afternoon at Mayowood with Mrs. Charles W. Mayo the hostess. Assisting Mrs. Mayo in receiving were Mrs. Rollo Packard, Mrs. A. C. Baker, and Mrs. M. A. Nicholson. Monday closed with "Open House" at the Mayo Civic Auditorium.

Tuesday, April 23, was devoted to the annual meeting which was held at the Rochester Country Club at 10 A.M. Mrs. A. C. Baker presided. Mrs. L. P. Howell of Rochester gave a cordial address of welcome which was followed by a response by Mrs. T. N. Fleming of St. Cloud. A memorial service was read by Mrs. E. M. Hammes of Saint Paul. A most interesting part of the program was the Demonstration Broadcast of the High School Radio Contest program which was introduced by Mrs. Marguerite Breen of the Minnesota Public Health Association and included talks by the high school contestants: Barbara Zeches, St. Charles High School, St. Charles, Minnesota; and Carl Baumgartner of St. Thomas Military Academy, Saint Paul. Mrs. A. C. Baker presented pins to each student and also presented the Auxiliary Trophy. Reports from the various officers, chairmen and county presidents were heard, and Election of officers followed. A luncheon was served at the Country Club when the newly elected officers were presented. Mrs. W. B. Roberts of Minneapolis awarded the President's Pin to the newly elected president, Mrs. M. A. Nicholson of Duluth, who responded with greetings. Malcolm McLean, Ph.D., Director of the General College of the University of Minnesota gave an address, "Are the Schools on Trial?" Following the luncheon the

Post Convention Board Meeting was held when various chairmen were named for the coming year. At 6:30 P.M. the annual banquet was held at the Rochester State Hospital with Dr. Bertram S. Adams, president of the Minnesota State Medical Association, as toastmaster. Dr. John DeJ. Pemberton, president of the Olmsted-Houston-Fillmore-Dodge County Medical Society, gave the address of welcome which was followed by the introduction of Mrs. M. A. Nicholson of Duluth, newly elected president of the Women's Auxiliary. The Southern Minnesota Medical Association Medal was presented to Dr. Carl W. Waldron and this was followed by an address by the Honorable Harold E. Stassen, Governor of the State of Minnesota. An interesting talk was given by Mr. Bernard H. Ridder, Publisher of the *Saint Paul Dispatch and Pioneer Press* on "How the Peace of the World was Lost."

Many visiting women remained for the Wednesday informal program and were graciously entertained at a coffee at 10:30 A.M. at the home of Mrs. D. C. Balfour. Mrs. M. S. Henderson assisted. This was followed by informal luncheons at the homes of local members and the close of a most interesting and profitable convention.

Newly elected officers for the coming year are: Mrs. John James Ryan, Saint Paul, president-elect; Mrs. R. J. Josewski, Stillwater, first vice-president; Mrs. R. H. Wilson, Winona, second vice-president; Mrs. W. F. Braasch, Rochester, third vice-president; Mrs. B. J. Branton, Stillmar, fourth vice-president; Mrs. T. N. Fleming, St. Cloud, recording secretary; Mrs. H. F. Wahlquist, Minneapolis, treasurer; Mrs. John Dordall, Sacred Heart, auditor.

Those in charge of the convention were as follows:

General Arrangements.—Mrs. G. B. Eusterman and Mrs. M. S. Henderson.

Registration.—Mrs. T. B. Magath, chairman, assisted by Mrs. J. E. Crewe, Mrs. H. C. Habein, Mrs. F. J. Heck, Mrs. L. M. Randall and Mrs. H. M. Weber.

Reservations.—Mrs. F. J. Moersch, chairman, assisted by Mrs. F. A. Figi, Mrs. B. T. Horton, Mrs. M. C. Piper, Mrs. B. F. Smith.

Transportation.—Mrs. S. W. Harrington, chairman, assisted by Mrs. M. W. Binger, Mrs. F. W. Gaarde, Mrs. D. F. Hallenbeck, Mrs. B. R. Kirklin, Mrs. L. E. Prickman and Mrs. E. C. Rosenow.

Exhibits.—Mrs. M. S. Henderson, chairman, assisted by Mrs. L. M. Eaton, Mrs. George Edward, Mrs. W. G. Grinnell, Mrs. B. E. Hall, Mrs. M. M. Hargraves, Mrs. P. H. Heersema, Mrs. E. A. Hines and Mrs. H. Paul Johnson.

Executive Luncheon.—Mrs. V. S. Counseller, Mrs. W. F. Braasch and Mrs. R. K. Ghornley.

Annual Luncheon.—Mrs. J. deJ. Pemberton, Mrs. Waltman Walters, Mrs. A. W. Adson.

Assisting hostesses at the tea at Mayowood included Mrs. M. J. Anderson, Mrs. N. W. Barker, Mrs. C. E. Bigelow, Mrs. A. U. Desjardins, Mrs. C. E. Dixon, Mrs. H. K. Gray, Mrs. W. C. McCarty, Mrs. H. B. Macey, Mrs. F. C. Mann, Mrs. Hamilton Montgomery, Mrs. J. T. Priestly, Mrs. A. B. Rivers, Mrs. A. M. Snell, Mrs. C. H. Watkins and Mrs. J. M. Waugh.

District Meeting

May 4 was the date chosen for the spring business meeting of the District Medical Auxiliary at the home of Mrs. O. K. Behr, Crookston, Minn. There were nineteen members present and before the meeting the group attended the dinner meeting with the District Medical Society at the Crookston Hotel. Mrs. S. H. Stuurmans, president, presided, and a paper which had been prepared by Mrs. J. F. Norman, was read. A report was given on the social events of the annual state meeting by Mrs. M. O. Oppegard. Mrs. A. R. Reff, Polk County chairman of the Red Cross knitting and sewing project for the war refugees, told the group of the success of the work in Crookston and urged more help for the project in the outlying districts.

The following officers were elected for the new year: president, Mrs. W. H. Hollands, Fisher; vice president, Mrs. J. L. Delmore, Sr., Roseau; Secretary, Mrs. G. W. Bohl, Ada; corresponding secretary, Mrs. H. H. Hedemark, Thief River Falls; treasurer, Mrs. C. L. Oppegard, Crookston. A program of fun entitled, "Information Please," was conducted by Mrs. H. H. Hodgson. Mrs. Behr served a late luncheon following a short session of bridge.

Those attending from out of town included Mrs. Delmore, Mrs. Anderson and Mrs. C. M. Adkins of Thief River Falls, Mrs. Stuurmans and Mrs. W. B. Torgeson of Oklee; Mrs. G. A. Sathiers of Fosston; and Mrs. Clark of Clearbrook. Mrs. O. O. Larson of Detroit Lakes was a visitor.

PROPAGANDA FOR REFORM

The Effect of Quick Freezing on the Nutritive Values of Foods.—At the request of the Council on Foods of the American Medical Association, Dr. Mary Swartz Rose has prepared a review of available evidence on the nutritive value of quick-frozen foods. Dr. Rose reports that quick freezing is a mode of food preservation which affords the consumer fresh material, free from inedible waste and held in cold storage until delivery. The number of micro-organisms in foods is greatly reduced by quick freezing. Extensive studies indicate that there is little danger from foods frozen and held in storage at temperatures below 32° F., but refreezing of products once defrosted is not a safe practice. Vitamin A values in foods are conserved by quick freezing. Vitamin B₁ (thiamin) is not affected by the freezing but considerable loss may occur in the processes of preparing food for quick freezing such as blanching of vegetables. To conserve vitamin B₁, the blanching time should be as short as is compatible with a product satisfactory in other respects. Little if any loss of vitamin G (riboflavin) has been observed in the quick-frozen vegetables investigated. Vitamin C (ascorbic acid) in fruits appears to be conserved by quick freezing and storage at low temperatures. Loss of vitamin C in vegetables depends partly on the completeness of the destruction of the ascorbic acid oxidase in the blanching process and partly on the conditions under which the vegetable is allowed to thaw. Loss in thawing can be avoided by cooking without defrosting. Partly on the basis of Dr. Rose's report the Council has voted to give consideration to quick-frozen vegetables and fruits with a view to inclusion in the list of accepted foods. (Jour. A.M.A., April 6, 1940, p. 1356.)

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Books Received for Review

CHEMISTRY AND MEDICINE. Papers presented at the Fiftieth Anniversary of the Founding of the Medical School of the University of Minnesota. Edited by Mruaice B. Visscher, M.D., Professor of Physiology at the University of Minnesota. 296 pages. Illus. Price, \$4.50, cloth. Minneapolis: University of Minnesota Press, 1940.

DIABETES. Practical Suggestions for Doctor and Patient. Second Edition. Edward L. Bortz, A.G., M.D., F.A.C.P. Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania; Chief of Medical Service B., the Lankenau Hospital, Philadelphia; Assistant Editor The Cyclopedia of Medicine. Foreword by George Morris Piersol, B.S., M.D., F.A.C.P. Professor of Medicine, Graduate School of Medicine, University of Pennsylvania and Editor in Chief, The Cyclopedia of Medicine. 296 pages. Illus. Price, \$2.50, cloth. Philadelphia: F. A. Davis Co., 1940.

THE COMPLETE PEDIATRICIAN. Practical, Diagnostic Therapeutic and Preventive Pediatrics. Third Edition. Wilburt C. Davison, M.A., D.Sc., M.D. Professor of Pediatrics, Duke University School of Medicine and Pediatrics, Duke University School of Medicine and Department of Pediatrics, Johns Hopkins University School of Medicine, Acting Pediatrician in Charge, The Johns Hopkins Hospital, and member American Board of Pediatrics, etc. 256 pages. Price, \$3.75, cloth. Durham, N. Car.: Duke University Press, 1940.

MANUAL OF FRACTURES, DISLOCATIONS AND EPIPHYSEAL SEPARATIONS. Harry C. W. S. deBrun, M.D., F.A.C.S. Adjunct Professor of Surgery, New York Polyclinic Medical School and Hospital; Associate Visiting Surgeon, Swedish Hospital, Brooklyn, N. Y.; Consulting Skeletal Surgeon, New York Police Department; Late Chief of Clinic, Reconstruction Hospital, N.Y.C.; Late Chief of Compensation Clinic, Beekman St. Hospital, N.Y.C.; Member, Association française de Chirurgie. Illus. Price, \$3.00, postpaid. 468 Pages. Chicago: Year Book Publishers, 1939.

The author of this volume has attempted to set down from his own experience the practical and helpful points found useful in the management of fractures. Of necessity, because of the size of the Manual, the result turns out to be largely a summary and tabulation of the means and methods employed in the present-day treatment of fractures. This is borne out by the fact that of the 150 illustrations practically one-sixth are reproductions from the catalogs of surgical supply houses.

This type of book presupposes a working knowledge of the subject. One who attempted to learn to treat fractures by consulting the Manual would be disappointed because of the lack of detailed information on the application of any one particular method, and by

the paucity of illustrations. This criticism could have been forestalled by including references to reliable articles dealing at greater length with problems in individual fractures.

It is interesting that a book on fractures could have been written with but a bare half-dozen illustrations from radiographs of actual fractures. The intention may have been to attempt to cover this subject in the special chapter written by a collaborating roentgenologist. This chapter, however, contains no illustrations of fractures. An opportunity was missed in not using this chapter to attempt to depict the methods and positions used in taking radiographs of patient with fractures, in and out of equipment, and the essential points in interpreting such pictures made under difficulties.

In spite of its shortcomings, the book is of value in furnishing a ready reference in refreshing oneself on the various methods applicable to any given fracture.

—JOHN F. POHL, M.D.

CANCER IN CHILDHOOD and a Discussion of Certain Benign Tumors. Harold W. Dargeon, M.D., F.A.A.P., Attending Pediatrician, Memorial Hospital for Cancer and Allied Diseases, New York; Associate Pediatrician, St. Luke's Hospital, New York; Associate Pediatrician, New York Foundling Hospital; Instructor in Pediatrics, College of Physicians & Surgeons, Columbia University. 114 pages. Illus. Price, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1940.

This volume represents a group of collected papers which originally appeared in the *Journal of Pediatrics*, the compilation being done by different staff men at Memorial Hospital, New York. All the articles emphasize the importance of cancer in the field of children's diseases.

Ewing's chapter on "A Survey of Cancer in Childhood" gives a comprehensive review of the literature and, I believe, is the best chapter in the book.

The symptoms, diagnosis, and treatment of the different malignancies is discussed in each chapter. The different conditions are fairly well illustrated.

Many references are given at the end of each chapter which no doubt include the outstanding articles referable to the particular discussion.

I believe the book will make us more conscious of childhood malignancies, leading perhaps to earlier diagnosis and a larger percentage of cures.

O. S. WYATT, M.D.

GOOD HEALTH AND BAD MEDICINE. Harold Aaron, M.D. A Consumer's Union Publication. 328 Pages. \$3.00. New York: Robt. M. McBride & Co., 1940.

Here's a readable, sensible book dealing with the common problems of everyday health. It is particularly directed to the gullible, misinformed millions who receive their medical advice from the nostrum-ads and commercial radio announcements. As such it deserves a place in every physician's reception room. It explodes the wealth of superstitions and delusions, which prevail over such subjects as colds, coughs, and constipation, and the abuses of the various analgesics and

antiseptics which often prove dangerous through their toxicity, as well as not seldom by their inadequacy.

Interesting chapters on diet fallacies, and on the vitamin racket are most timely. Some valuable observations on the care of teeth, and on the comparative value of the various brands of tooth pastes and tooth powders are noteworthy. The place of stimulants in the daily regime is sensibly treated. The discussion of the abuse of, and false claims for, the various types of physical therapy in the home is well handled.

Each chapter is followed by a list of acceptable and non-acceptable products which renders the volume of added value to the reader. The physician may also read this with benefit, and find some valuable suggestions and formulæ in the text.

THOMAS MYERS, M.D.

HERNIA; ANATOMY, ETIOLOGY, SYMPTOMS, DIAGNOSIS, DIFFERENTIAL DIAGNOSIS, PROGNOSIS, AND THE OPERATIVE AND INJECTION TREATMENT. Leigh F. Watson, M.D., Member Staff California Lutheran Hospital and Methodist Hospital of Southern California. 591 pages. Illus. 2d ed. \$7.50. St. Louis: C. V. Mosby Co., 1938.

Watson's second edition of his monograph on hernia has taken into account the modern trend for the injection treatment of well selected cases. His chapters on this phase of hernial treatment are very well written, especially as they come from a surgeon with extensive experience in the operative work as well. The entire work has been brought up to date and there is no finer monograph on the treatment of all forms of hernia.

The small chapter on medico-legal aspects of hernia could well be studied by any physician who treats hernias.

This monograph is valuable mostly as a review volume covering all phases of this very important subject.

EUGENE E. SCOTT, M.D.

DIAGNOSTIC STANDARDS AND CLASSIFICATION OF TUBERCULOSIS. Committee on Diagnostic Standards, Fred H. Heise, M.D., Chairman. 32 pages. New York: National Tuberculosis Association, 1940.

Currently accepted standards in diagnosis, treatment and prevention of tuberculosis are given in the new edition of "Diagnostic Standards and Classification of Tuberculosis" issued by the National Tuberculosis Association.

The new edition of the publication incorporates many ideas of physicians who gave the Standards in the tentative edition, published in 1938, a practical trial during the last two years, according to Dr. Fred H. Heise, medical director, Trudeau Sanatorium, Saranac Lake, N. Y., who is chairman of the Committee on Diagnostic Standards.

Some of the changes in the new edition are in terminology. The terms "primary" and "reinfection phases," are used to replace the terms "childhood type" and "adult type," respectively. This change is due to the fact that primary infections occur in adult life more frequently than formerly simply because fewer children become infected.

The term, "frankly active," is now employed to in-

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, **AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES**, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

clude the cases formerly classified as "improved and unimproved," though these terms are retained as subdivisions.

The section presenting the pathogenetic development of pulmonary tuberculosis discusses fully the primary and reinfection phases of tuberculosis, initial lesions, prevalent types of retrogression and progression, and the histologic characteristics of the two phases of the disease.

The necessary correlation of the clinical symptoms of tuberculosis with the pathologic course of the disease is emphasized and many such correlations are given as illustrations.

The diagnosis of tuberculosis is discussed from the standpoints of pulmonary tuberculosis with and without symptoms, the primary phase of the disease, non-pulmonary tuberculosis and differential diagnosis.

The technical procedures in the diagnosis of tuberculosis are fully presented. The methods and the interpretations of the intracutaneous tuberculin test are discussed, as well as the demonstration of the tubercle bacilli in the sputum, stomach washing and other body fluids.

Many factors involved in the taking of the radiograph and its interpretation are evaluated.

This publication is available to Minnesota physicians on request to the state and local Christmas Seal organizations. Requests can be made to the Minnesota Public Health Association, 11 West Summit Avenue, Saint Paul, Minnesota.

HEIL HUNGER! Health Under Hitler. Dr. Martin Gumpert. Translated from the German by Maurice Samuels. 128 pages. New York and Toronto: Alliance Book Corporation—Longmans, Green and Co., 1940. Price \$1.75.

The author effectively destroys the myths created by Nazi sympathizers that Hitler transformed a sick, degraded people into a healthy, vigorous nation. The findings of the author to the contrary are the more convincing, because they are based on original German scientific sources, plus numerous reports on health conditions in Germany which appeared in the *Journal of the American Medical Association*.

On the strength of these documents, an entirely different picture emerges. In Germany today, there is no specific state of hunger, but rather, a treacherous chronic state of undernourishment. This is the more ruinous because of the great physical strain to which the population is subjected. Labor is forced with no regard as to fitness and experience; hours are long, wages small, and vacations infrequent. Child labor is exploited; women are driven into industry in a proportion far exceeding that of any other country. Athletics of a strenuous character and military exercises are compulsory. At the same time, medical science and its practice is undermined through mass expulsion of non-

Aryan physicians, by curtailing medical courses and hospital training, by licensing quacks, and by rigid governmental control.

Lack of medicaments to an extent where such staples as cod liver oil, boric acid and iodine are unobtainable is also a great detriment to health. The results are disastrous indeed. Diseases of malnutrition such as scurvy and rickets, long forgotten in Germany, have reappeared. Tuberculosis of men and cattle alike has increased tremendously. Venereal diseases are widespread. Insanity is in the ascendance. The birth rate, contrary to expectation, is falling while the death rate is mounting.

Because of the physical and nervous strain, and also due to increase in the consumption of alcohol encouraged by the government for fiscal reasons, suicide has become a frequent occurrence. That the unfortunate non-Aryans seek in death an escape from their misery is a factor overlooked by the author. However, be that as it may, the number of suicides in Germany for the last four years is almost equal to that of the rest of Europe for the same period.

Ruined health, semi-starvation, and the wholesale sacrifice of the flower of the nation on the altar of the God of War—that is the price of Naziism.

M. L. ZLATOVSKI, M.D.

PHYSICAL DIAGNOSIS, (Elmer and Rose) 8th edition. Revised by Harry Walker, M.D., F.A.C.P. 792 pages, Illus. Price \$8.75. St. Louis. C. V. Mosby Company, 1940.

The present author has undertaken the commendable task of attempting to bring physical diagnosis into present-day perspective. Prejudiced authors have exaggerated their powers of observation and bewailed the blundering dependence of others on laboratory methods and vice versa. The author's sincerity is manifested by his critical treatment of all recognized signs and additional collaboration with men working in neuropsychiatric, endoscopic, pathologic and medical fields.

The difficulty of combining just enough monographic clinical medicine in each section is met by including the bare essentials of physiology of the various systems and etiology and pathology of specific diseases. Illustrations, diagrams, x-ray films and electrocardiograms are used to amplify the text. The synopsis of neuropsychiatric examination impresses me as a valuable inclusion in such a book. In that, as well as in the remainder of the last half of the book, the necessary conciseness precludes expansive detail. Luten's section on the heart is a masterpiece of concise comprehensive and practical coverage.

I feel that the present revisor has achieved his objective, i.e., to impart a practical diagnostic perspective.

R. L. NELSON, M.D.

MINNESOTA MEDICINE

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No. 7

MODERN TRENDS*

BERTRAM S. ADAMS, M.D.

Hibbing, Minnesota

THE medical profession is facing a challenge today—a challenge from those who favor government control of medical care, believing it to be more effective. Our critics claim that many persons are forced to go without medical care because it is not offered to them at terms they can meet. We are told that the family doctor era is past and that because medical care has become highly specialized, newer methods of making it available should be developed. They want the Government to collect a small fee from everyone in the lower income brackets. To this will be added a similar amount by the employer. These together will entitle those paying and their families to medical care—the European system.

The challenge also comes from our friends who think that our American system of medical care is in grave danger, and that something should be done to avert such a crisis. They believe that government control will lower standards of medical care, and hinder advancement.

We must not be blind to the facts giving rise to this challenge. Vital adjustments of a socio-economic nature are affecting the character of our people. Our frontiers are gone; our young people no longer look forward to moving west and making a fortune. Instead they are satisfied with salaried positions. Many are unemployed, and some may never again find private employment. Incomes are not high, yet everyone spends money for automobiles, radios, movies, and whatnot. What used to be luxuries are now necessities. Their income is spent by the end of each month. People do not accumulate savings to meet a catastrophe in the form of sickness.

On the other hand, the cost of medical care has increased due to scientific advancement, improved methods of diagnosis and treatment, laboratory and x-ray facilities, surgical and specialized medical treatment calling for hospitalization and for nursing services. The advances in medical science require correspondingly longer periods of study for professional students as well as more frequent periods of postgraduate study for those in active practice. It also necessitates specialization with its increased costs and larger fees. All of these contribute toward making modern medical care the most efficient ever known, but also the most costly.

Another fact is that, while people in the lower income bracket may be content and happy in a humble home with simple clothing and food, when sickness comes they, too, need the best of medical care and service. Hospitalization, laboratory and x-ray services, surgery, blood transfusions, consultations—all these are necessities regardless of financial status.

To be remembered also is the changing character of disease incidence; diseases that were common forty years ago are now rare. Others are assuming greater importance. The degenerative diseases accompanying old age and requiring medical care over a long period of time—care that is frequently of an expensive nature—constitute an important phase of medical care today. "Data from the National Health Survey, based on surveyed persons of all ages, show that chronic diseases, including permanent impairments, alone account for six of the ten days of incapacity due to illness and accident experienced by the average person per year." On the other hand, the infectious diseases are constantly decreasing.

*Presidential address before the House of Delegates at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 21, 1940.

Our answer to this challenge is that our American system of medical care gives better medical care and better service to the entire population than is given by the European system or any other system yet devised. It respects the personal relationship between the physician and his patient. It maintains his self-respect and encourages him to give to his patient the best that medical science has taught him. The remuneration of the average physician in this country is greater than in any other country, and this provides additional incentive for work of fine quality. Were the European system introduced into this country and the same quality of service maintained as is now given, the costs in taxation would be prohibitive. In preventive medicine, the most important field of medicine and the one in which the most progress is expected in the future, our country leads all others by a wide margin although, theoretically, the European system should be more effective.

As an example, I wish to point out the achievements of American medicine in coöperation with State Boards of Health and the United States Public Health Service. Striking is the reduced incidence of such diseases as typhoid fever, typhus, plague, smallpox, and yellow fever—far below that in any other country. As a result of immunization, diphtheria seldom occurs in this country. Because it is largely a disease of childhood occurring especially among the lower income groups, one should expect it to disappear under the European system of pre-paid medical care; but the facts are otherwise. While diphtheria in this country decreased 88 per cent between 1928 and 1936, the drop in England under the panel system was only 16 per cent. In Germany, which has had sickness insurance under government control longer than any other country, there was even an increase of 17 per cent. If the plans of our State Committee materialize, immunization will soon wipe out diphtheria in Minnesota. The same is true of tuberculosis. During this same period tuberculosis dropped 36.2 per cent in this country as compared with 28 per cent in England, and 22.7 per cent in Germany.² Until recent years this disease was the chief cause of death in the United States; it is now seventh in the causes of death. In 1909 fully one-fourth of the admissions to Gillette Hospital, Saint Paul, were for tuberculosis; today less than 1 per cent have that disease.⁹

Our State Committee on Tuberculosis hopes to see the disease completely eradicated before many years. By testing every individual with tuberculin, by taking annual films of all positive reactors, and by isolating all active cases, the Committee believes this can be done. Venereal diseases are being more and more efficiently controlled, especially in Minnesota. Crownhart quotes the following from an English statement: "The health needs in a country that has had a quarter of a century of sickness insurance are greater than in a country that has not had this legislation." He adds, in comment: "While the theory of sickness insurance indicates its use as a powerful weapon in disease prevention, there is no indication that it has ever occupied that rôle."³

American medicine, assisted by child welfare agencies, has done much in preventing and treating diseases of infancy and childhood. In 1900 it was estimated that one child died for every five births and in 1932 one for every thirty-two.⁸ Using statistics from Duluth as a fairly typical city, we find: Deaths under one year of age have decreased from 24 per cent of all deaths in 1900 to 5 per cent in 1937; during these same years, deaths in people over seventy-five years have increased from 4 per cent to 25 per cent; the average length of life has increased from 26.79 years to 58.65 years, while the number of persons attaining forty-five years or more has increased from 24 to 79 per cent.⁴ But in England, 11.6 babies out of every 1,000 died in the first twenty-four hours in 1906-1910. In 1935 the figure was 10.7.³

Another new field of medical endeavor relates to the work of the new Council on Industrial Diseases, formed by the American Medical Association three years ago. A large number of diseases have been called compensable by the courts. These diseases and their relation to industry are being studied in thirty-four states, annual conferences are being held, and a survey is being made by the Public Health Service. Our new State Committee is studying this subject and plans will be formulated as seem advisable.

We take justifiable pride in the reduction of time lost from work through accidents and disease by industrial workers. The iron and steel industry is fairly representative of all industries. Between 1907 and 1932 there was a 78 per cent decline in the number of accidents in this indus-

try, while the loss in time dropped from 6.9 days to 2.19 days, or 68.3.⁶ In England time lost through accidents and disease has increased 200 per cent since the panel system was introduced in 1911, and in Germany the rise has been 300 per cent since Government control was started in 1883.⁷ Gustav Hartz, an economic writer in Berlin, writes, "Since the sick insurance has been in effect, the number of days of incapacity to work owing to ill health, has risen from five and one-half days to twenty-eight days."⁵

Along this line is an evil which should be corrected, namely, the court procedure in cases in which medical testimony is required. It is unfair to allow the attending physician to testify as an expert witness. The present custom of permitting both the plaintiff and defense to present expert medical testimony is disgraceful to both the medical and legal professions, and fails to give testimony that is unbiased. We hope to initiate a procedure which will be fairer and more scientific.

In every other line of medical endeavor, study and research are being done; progress requires time, but efforts are not being spared.

To meet this challenge of our critics, we must give service that is not only better than any given elsewhere, but care so good that it will sell itself. We must acquaint the public with what has been done and what our goals are.

The challenge brings out another phase, an obligation that devolves upon every member of our organization. Believing as we do that our American system of medical care is better than the European system, and confident that it provides better medical care for the patient, permits full development of preventive aspects of medicine and is more responsive to advancement of medical science, we should do all in our power to retain it. We cannot permit a misguided and badly informed group of political leaders to force the European system of medical care upon the country without our serious protest. We shall indeed be remiss in our duty if we, the medical profession of America, who are informed on medical subjects, do not enlighten the public in regard to what we believe to be best for the health and physical well-being of every American citizen, and for the advancement of medical science.

Government control of medical care involves a great deal more than payment for the costs of

the sickness and injury; it restricts the freedom of those who minister to the physical welfare of the people. Rules and regulations to cover the smallest details will be made here just as they have been made in Europe. Innumerable reports will be required which will occupy the time the doctor should be giving to his patient. Since the doctor will be employed by the government and not by his patient, there will be a loss of the confidential relations between the doctor and the patient. As Crownhart says, "The primary responsibility of the physician is to the Government and not to his patient."³ Again quoting Crownhart, "The tendency of sickness insurance systems is to make the physician the re-insurer of the unknown demands, thus loading him beyond his capacity to render a sound quality of sickness care."³ The quality of goods or the value of service bought depends on the price paid; the European system has always paid a low price to the doctor and the result has been an inferior medical service.

Improved methods of distributing and making available medical care should be developed; several hundred plans have been devised by medical societies based on insurance principles and involving prepayment for medical care by industrial groups. So far these are experimental and untested. California began operation of a plan developed by their State Medical Society last year; the Michigan Medical Service organized by the State Medical Society, started operation last January. A number of contract plans are in use, the oldest probably being that used successfully for three-quarters of a century throughout the Lake Superior mining districts. This is probably the simplest and most economical plan in operation. Whatever the system may be, one important principle must be retained; the medical profession must be given freedom to act; the physician must be allowed to use his judgment, ruled by his own Code of Medical Ethics which is as important a guide to upright conduct today as it was in the period of Hippocrates.

The medical profession is earnestly trying to give the best possible service to the public. Its members are working steadily to keep abreast of new developments and improvements in medical care. Preventive medicine offers the greatest hope for ameliorating sickness, suffering, and invalidism, and needs our most serious efforts. If, unhampered by restricting regulations, we can be

allowed to continue our efforts along these lines, encouraged by public sentiment, stimulated by energetic efforts of public health activities, and aided by new improvements and discoveries in chemistry, physics, and engineering, the progress already made should be but the entrance to an era of medical achievement unrecorded in history.

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MEDICAL SYMBOLISM IN THE MYTHOLOGY OF ANCIENT GREECE*

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STUDENTS of Homer have in the *Iliad* and *the Odyssey* a storehouse of Greek myths, of legend and of symbolism. No attempt will be made to cover all of the myths relating to the snake, much less to report those concerned with other animals or with gods where insignia do not specifically include the serpent. Only the life and deeds of Æsculapius, the "blameless physician" of Homer, and some of the lore concerning Hermes, self-confessed king of robbers, will be considered.

A number of legends are connected with the birth of Æsculapius. The one most appealing to a physician is that in which his mother, Koronis, with child by Apollo, is related to have fallen in love with Ischys. Because of her unchaste deed Apollo sent his sister to punish her. While Koronis lay on her funeral pyre Apollo relented, "seized the babe from its mother's womb" and hastened to Cheiron, the centaur, so that the babe might be educated in medicine and learn to assuage the pains and cure the diseases of mortals.

In the Epidaurian legends it is stated that Æsculapius was nursed by a goat and guarded by the shepherd's dog. When the babe was discovered by Aristhanas, the shepherd, the babe shed a radiance about itself which proclaimed it to be of divine origin. Perhaps this legend accounts for the fact that the dog was often associated with the serpent in ancient carvings of the god Æsculapius. As a child, he learned all

the uses of drugs and much of hygienic treatment from Cheiron, and even while still a lad he is reputed to have cured the sick and raised the dead. He went with the Argonauts on their voyage to Kolchis, and proved himself the best of the students of Cheiron. He trained his sons to be physicians, and they became proficient and distinguished themselves as healers during the long years of the Trojan wars.

The followers of Æsculapius were the earliest to develop and record clinical observations and to establish the practice of medicine on a reasonable basis. In the sixth century B.C., a shrine was established at Epidarus and this sanctuary became the chief center of the cult; ruins may be visited to this day. From this center, the teaching of Æsculapius and his practice of medicine spread throughout the world and more than 400 shrines or sanatoria were set up. Serpents were always found at the shrines, and legend records that many of the shrines throughout the world were located where snakes took up their abode. Sometimes, the snake was sent with the priest to represent the god, as was the case during the terrible pestilence of 293 B.C. that afflicted the city of Rome "with prodigious mortality."

It is stated that Æsculapius retained his supremacy as a healer until the Christian Era. An interesting legend records the circumstances of his death. It was claimed by Hades that Æsculapius was prompted by avarice and an improper desire for gold, and that he imparted his art to mortals, which was contrary to the will of the

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Remarks before the House of Delegates of the Minnesota State Medical Association, April 22, 1940, on presentation to the Speaker of a gavel designed and carved in Minnesota black walnut by Dr. Lemon.

gods. Hades further complained to Zeus that the success of the medical care given by Æsculapius had averted too many deaths and consequently threatened to depopulate his realm. Zeus was angered and sent a flaming thunderbolt from Olympus and slew Æsculapius, thus making the Olympian immortal. "Incineration by a thunderbolt implied celestial or Olympian immortality."

It is particularly appropriate that Æsculapius should have the serpent for his emblem. The snake was the symbol of life and sagacity and was known to the Greeks as a sacred and mystic being whose magic powers were associated with dreams, prophecy and healing. In sculpture, the snake is always represented as coiled about a staff which the god Æsculapius carries (Fig. 1), or about his body and lower limbs. The snake's habit of sloughing its skin is one of the reasons for its reputation as a healer. Tyson quoted from Ovid: "It was natural to suppose that a creature which could renovate itself could also renew the energies and prolong the life of the sick and the suffering," and he pointed out that both the Latin and the Greek word for old age was also applied to the slough of serpents.

Snakes and dogs were found at all the temples, and snakes are pictured in drawings of the abaton where sick people came and slept while undergoing treatment. It was thought that the divine healing power was transmitted to these animals. Lacerations were healed when licked by cult reptiles, and the blind were made to see when the eyes had been licked by the sacred dogs. It is also recorded that baldness, as well as blindness, was cured by the touch of the hand of Æsculapius, who came to the afflicted while they slept. Sometimes Æsculapius came to the sleeping patient in the form of a serpent.

Today, the signum of Æsculapius is a single snake coiled about a rough olive branch. In earlier times, the shoots of the branch were adorned with ribbons or garlands.

The God Hermes

The Greek god Hermes, sometimes said to be the half brother of Æsculapius, is identified by the Romans with Mercury. He was the son of Zeus and Maia, and Mount Cyllene in Greece was reputed to be his birthplace. His reputation as the master thief among the gods began while he was still an infant. He was a precocious child and while yet a newborn babe began his

life of thievery by stealing the cows of Apollo. He became lord of those who swindle, house-break, sheep-steal and shoplift. He was represented as the god of thieves, of travelers and of shepherds. He was called crafty and tricky,



Fig. 1 (Left). The seal on a doctor's diploma of the medical faculty of Montpellier (1605). Æsculapius is shown seated on a hillock on which medicinal plants are growing; also the coats-of-arms of France and Montpellier. Engraved by the sculptor Jean Leblanc, Montpellier. Reproduced by permission of Ciba Symposia.

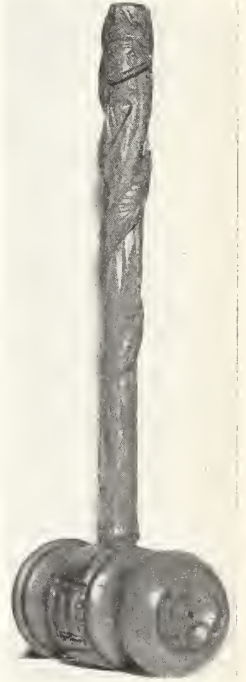


Fig. 2 (Right). The gavel which was presented to the Speaker of the House of Delegates of the Minnesota State Medical Association at the Rochester meeting in April, 1940.

and was often referred to as the giver of fertility. According to Plutarch, the ancients set Hermes by the side of Aphrodite, that is, the god and goddess represented, respectively, the male and the female principles of generation, and the two deities were worshipped together. Aphrodite was known as the goddess of love and the reproductive powers of nature. Our word, "hermaphrodite," a combination of "Hermes" and "Aphrodite," recalls the myth of their son, Hermaphroditus, who grew together with the nymph of the fountain of Salmacis while bathing and thus combined male and female characteristics: a creature half man, half woman.

As a messenger, Hermes became the god of roads and doorways and the protector of travelers. Treasure found on the road was spoken of as a gift of Hermes, and he became the god

of good luck. He became the deity of gain and commerce and, like Mercury, was known as the god of trade. His office as god of trade is reflected in words of common use today. In 1756, Rolt described the hermetic seal as used in trade, which consists of airtight closure of a vessel by fusion, soldering or welding. In a surgical sense, the hermetic seal of wounds refers to a method of dressing penetrating wounds, especially of the thorax and abdomen.

Hermes appears to have had admirable qualities, too. He was worshipped by farmers because he brought luck, probably by insuring fertility and adding increase to the herds. He became the sponsor of games, and his statues were common in Greek gymnasia and stadia. As such, he came to impersonate the ideal Greek youth, who was graceful and dexterous as well as strong, courageous and eloquent. He was the giver of grace, rather than strength, which was the province of Hercules. Because of the influence of Praxiteles, he is commonly represented as a youth with caduceus or rod, petasus or brimmed hat and talaria or winged shoes.

He was a patron of music, and invented the cithara which he played so beautifully and so pleased Apollo that, in exchange for the instrument, Apollo gave him a herald's wand and made him a messenger between the gods and man. It is stated in another legend that he evolved a lyre with great ingenuity from the shell of a tortoise, and played so divinely that the enchanted Apollo gave him the wand. In his office as messenger of the gods, he conducted the souls of the dead to the world below. It was said that his caduceus or magic wand exercised an influence over the living and the dead, bestowed wealth and prosperity, and turned everything it touched to gold.

He is supposed to have been one of the gods of healing, but he, whose caduceus we sometimes use as the insignia of medicine, seems to have had but few contacts with healing. He is reported to have performed one of the earliest Cesarean sections when he delivered Semele of Dionysus. The account of this is not dissimilar to the delivery by Apollo of Æsculapius, whom he tore from the body of the beautiful Koronis. Hermes also stopped a plague at Tangara by carrying a

ram on his shoulders around the walls of that city. But there Hermes' connection with medicine comes to an end.

The Caduceus

The caduceus, or herald's wand, was given to Hermes by Apollo. In the *Encyclopædia Britannica*, the author says: "In its oldest form it was a rod ending in two prongs twined into a knot (probably an olive branch with two shoots adorned with ribbons or garlands) for which, later, two serpents with heads meeting at the top were substituted. The mythologists explained this by the story of Hermes finding two serpents thus knotted together while fighting; he separated them with his wand which, crowned by the serpents, became the symbol of the settlement of quarrels. A pair of wings was sometimes attached to the top of the staff in token of the speed of Hermes as a messenger. In historical times, the caduceus was the attribute of Hermes as the god of commerce and peace, and among the Greeks it was the distinctive mark of heralds and ambassadors whose persons it rendered inviolable."

It would appear that the caduceus has scant claim to medical importance and should not be used as the symbol of medicine. That right should be given to the signum of Æsculapius* and this should always be represented as a single snake coiled around a knotted staff.

Presentation

Mr. Speaker: I have designed and made a gavel for the use of the Minnesota State Medical Association (Fig. 2). It has for its handle a roughly carved rod ending in two prongs, and coiled about it I have represented a snake. It is intended to resemble the signum of Æsculapius. On one face of the hammer there is an open book, and on the other a Grecian lamp. I hope you will accept the gavel in the name of the Association and that it may be used whenever the members are called together.

*The signum of Æsculapius was the accepted symbol of medicine until the reign of Henry VIII. Then, Sir William Butts, the King's physician, confused it with the caduceus of Hermes. A few years later, Dr. John Caius presented to Gonville and Caius College, Cambridge, a silver caduceus. This form of symbol is used only in the United States.

TUBERCULOSIS CASE FINDING AMONG AMERICAN COLLEGE STUDENTS*

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THE battle for the control and eventual elimination of tuberculosis is being waged along many fronts. One of the most important and promising is that occupied by our colleges and universities. The educational environment lends itself ideally to the formulation and direction of an effective system of health supervision, as well as offering opportunity for lasting imprint on the minds of those soon to succeed to leadership of American enterprises. More practical is the fact that during the years normally spent in colleges and graduate schools, tuberculosis remains, in its very essence, the prime threat to life and health. This arises from no particular hazard of undergraduate existence, nor from some perverse process of selection which would act to fill colleges and universities with young men and women possessing poorer than average health. It is due rather to the well recognized phenomenon of tuberculosis' heightened morbidity and mortality during late adolescence and early adult life. Here, then, are the young people. Here, too, is the menace of unrecognized tuberculosis. You may be interested in what is being done to safeguard the first-named from the latter.

It is twenty years since Myers and his co-workers began their student chest clinic at the University of Minnesota, a mere moment in medical history, but a long, fruitful period in the vanquishment of tuberculosis. From that humble beginning evolved a plan of advancing to meet trouble more than half-way, of searching for it constantly, of harrying and badgering tuberculosis, instead of waiting patiently, idly, for the manifestations of advanced disease to appear through the development of signs and symptoms. Other schools have caught the vision, largely due to the leadership, example and enthusiasm of men like Myers, until today there are nearly 200 institutions of higher education in the United States providing some degree of tuberculosis case finding among their students.¹⁷

You shall hear a few of the results reported

by colleges to the Tuberculosis Committee of the American Student Health Association annually, and by the Committee summarized and turned back to the colleges. The Tuberculosis Committee, formed in 1931, is but a recent recruit in the anti-tuberculosis forces. Yet its sphere of influence grows so rapidly, as more schools inaugurate modern tuberculosis control projects, that it is difficult to anticipate, to say nothing of meeting the needs of an expanding horizon bounding the academic field of action. Nevertheless, though recent development of interest has seemed phenomenal, there has been no hint of mushroom growth. Instead, during the years when it appeared that only a few larger universities would or could accept the challenge to embark on a campaign of early diagnosis, early treatment, early arrest, adequate foundations for a thorough-going national collegiate program were being laid. As a result, close and satisfactory working arrangements exist between the Student Health group and the National Tuberculosis Association. Presently, plans are being discussed that should gradually eliminate the early inevitable centralization of effort and direction, substituting for it an enlistment of sectional Student Health organizations and local tuberculosis agencies. Thus, each year, the activities of the Tuberculosis Committee promise to grow more preceptual and advisory, its annual Report a clearing house for mutually helpful data. Our replies to future appeals from colleges struggling with new programs will take the shape of notifying the nearest tuberculosis associations, giving them the facts, and asking them to render all possible aid. One of our chief responsibilities will continue to be the discriminating selection and dissemination of proved new methods by which student tuberculosis case finding may be strengthened, accelerated, reduced in cost, augmented in effectiveness.

Having reviewed the popular growth of tuberculosis control in American colleges (57 per cent increase during the last two years), and hinted at future needs (over three-quarters of the in-

*Address delivered before the Minnesota Trudeau Medical Society, Hotel Nicollet, Minneapolis, February 23, 1940.

stitutions still with no programs), let us examine the facts deducible from the data concerning current action. It will be unnecessary to employ the arguments to which we must have recourse when bidding for the interest and support of such laymen as college deans or presidents. Nor will it be necessary to stress the importance of student tuberculosis as when we address partially convinced student health administrators and physicians. You are daily in contact with tuberculosis, more often than not in a stage you would gladly exchange for an earlier and more hopeful one. Accordingly, though you may not all agree with everything presented, all should admit the problem of student-age tuberculosis, the need for adequate means of solving it, and the advisability of reasonably uniform methods of approach toward its solution.

Whether we consider national figures, or those from individual institutions such as the University of Pennsylvania or our own University of Minnesota, or such regional reports as the detailed analysis recently made in the Pacific Northwest,¹⁵ comparable facts emerge and similar lessons are to be learned. Most of the facts are so well known to tuberculosis workers that it seems banal to reiterate them. The value of the tuberculin test,⁸ the need for adequate dosage whenever the test is employed, the diagnostic aid of the roentgenogram along with its limitations,⁹ the necessity of painstaking follow-up and evaluation of the status of every suspected case, the importance of crowning early diagnosis with effective treatment, the demand for a program that traces contacts and hunts sources, are all points so self-evident that they call for dismissal without elaboration. Experience teaches, on the contrary, that these may be the very facts whose familiarity has acted to disarm us, and to breed in initiated minds a certain amount of forgetfulness, if not contempt.

Our Report for 1938-39 lists 282 replies to the Committee's questionnaire from colleges and universities, of which 165 reported some form of tuberculosis program in operation. Tardy returns, plus new programs known to have started last fall, to say nothing of several programs in progress at negro colleges, would swell the total until, as stated earlier, there are close to 200 schools with case finding in effect. The institutions replying were of all sizes and types, ranging from ninety small schools with enrollment below

500, through 150 middle-sized colleges, to thirty-five large institutions having 4,000 to 16,000 students apiece. Among those with tuberculosis work under way, seventy-eight represented privately endowed colleges and universities, forty-three were in the category of State universities, colleges or institutes, thirty-seven were State teacher's colleges and normal schools, and seven were civic institutions. All sections of the country were represented in the honor roll of schools with programs, including eighteen in New England, thirty-one in the Middle Atlantic and eight in the Southern Atlantic areas, twelve in the deep South, nine in the Plateau and Mountain region, twelve in Pacific coast States, and seventy-five in the States of the Northern Mississippi basin. The initial leadership provided by our own district is again evidenced both in the volume and quality of work recorded in the last-named portion of the nation.

Analyzing the figures from the 165 institutions possessing a tuberculosis set-up, we find 143 testing with tuberculin, while twenty-two resort to x-ray as the first step in their screening procedure. We are aware of the difficulties at various schools which have led to adoption of this latter method, including real or fancied student distaste for the tuberculin test, a high incidence of positive reactors as in most Eastern colleges, and the time, energy and expense demanded by careful tuberculin testing. None the less, we have campaigned for and will continue to advocate prior tuberculin testing, since it provides the only sure way of discovering better than 90 per cent of the presently infected individuals. Moreover, the retesting of negative reactors at appropriate intervals, preferably annually, gives definite indication of tuberculo-protein allergy very shortly after its development, on the one hand, or its resumption by those few who may have achieved anergy for a time, only to revert to positivity through reactivation of once inactive, apparently well-calcified lesions.^{3,7} The benefits of tuberculin testing so far outweigh the admitted bother and the negligible expense that we feel the method should be preserved intact, its use spread rather than abandoned for what may be a questionable shortcut. At the same time, we admit the advantages of *any* intelligently conceived and directed system of tuberculosis control as contrasted with none. Our thesis is that tuberculosis *control* in its very essence depends on case

finding, that is, discovering as many infected humans as possible with the means available. If this contention be accepted, then tuberculin testing becomes an initial procedure for which, up-to-date, there is no substitute.

Last year the vast majority of tuberculin testing colleges used the Mantoux intradermal technique, 136 in all, while three employed von Pirquet, and four experimented with the Vollmer patch test. Here, again, we have maintained a conservative attitude but an open mind, pointing out that where the Mantoux method is used, the clinician is sure at least that tuberculin of measured quantity and reasonably standard potency actually entered the skin layers, and that premature removal of a patch, dilution of tuberculin by water or perspiration, side effects of air due to imperfect seal, or non-specific skin reactions to adhesive substances are not possible. We have urged colleges to give the patch test a thorough, controlled trial, comparing it as several pediatricians have done,^{10,16} with the Mantoux or von Pirquet results, and checking all tested persons with searching roentgenographic studies. Where this has been done, we learn the patch test is roughly comparable to a first-strength dose of Purified Protein Derivative administered intracutaneously. This would indicate that patch test negatives should have benefit of a further test with 0.005 mg. P.P.D. or 1.0 mg. O.T. Further investigation may even lead to combining the two methods if such a departure proves reliable and economically advantageous.

P.P.D. was the testing material of choice in seventy-nine colleges; fifty-five others used O.T.; five failed to specify, and four employed the patch test. It seemed to matter little which of the first two products was used, so long as an adequate dosage was reached before students were classified as negative reactors. There were 33,355 students tested with the standard maximum of 0.005 mg. P.P.D. in forty-eight colleges, and 30.5 per cent reacted positively, while in thirty-four other schools where the dosage of O.T. ran to 1.0 mg. and where 21,516 students were tested, 30.1 per cent gave positive reactions. Thus, although the Committee has recommended use of P.P.D. for reasons of uniformity and standardization, it is much more concerned with the selection of potent products and the carrying of the dosage to a point where no significant proportion of truly positive reactors will be

overlooked. Though many observers have maintained the lower dosage to be capable of identifying most cases with clinically significant lesions, we have personal experience and receive further reports from others to support the contention that many instances occur where cases of active tuberculosis showed negative or equivocal reactions to the usual first strength dose of 0.00002 mg. P.P.D., or 0.01 or even 0.1 mg. O.T.¹⁴ Therefore, we prefer to advocate retention of a highly dilute first dose, or, perhaps, in areas with low infection rates, an intermediately-sized dose, so that persons with marked allergy may be spared violent reactions, and to urge the use of a much concentrated second dose in order to locate positive reactors who otherwise would be missed. In each of the past two years eighty-two colleges followed the recommended procedure, reporting a positivity of approximately 29 to 30 per cent. A lesser number of schools, annually testing up to 20,000 students with what we, at least, term below an adequate dosage, succeeded in finding only about 15 per cent positive reactors. Admittedly, we are averaging results from scattered institutions, so that these figures are presented not as exact computations, but merely to indicate general truths. The basic moral to the story, namely that adequate dosage is imperative, is in no wise disturbed, especially as the sampling is nationwide and includes a generous number of tuberculin tests. Furthermore, where the two methods have been tried out under ideal conditions, that is, concurrently within the same institution, as investigated by Canuteson at the University of Kansas over a three-year period,² the discrepancy in results caused by testing with unduly small doses of tuberculin was quite as marked as in the quoted figures collected from well distributed national experience.

That our harping on the necessity for unceasing prosecution of case finding is bearing fruits is borne out by a steady increase in the percentage of colleges providing annual retest for their previously negative reactors. Others, not yet equipped to go this far, preliminarily test new students, retest seniors. Still others make the test available annually to any student electing it. The entire movement seems to be toward increasing the scope and effectiveness of existing programs, as well as toward establishing new ones. Seldom do we hear of one being

abandoned, and very infrequently of any that stand still or regress. This heartening improvement is further underscored by such advances as a total of seventy-one colleges requiring tuberculin testing and roentgenograms of all their food handlers. Two years earlier there were only thirty schools in this progressive category. Then there were twenty-nine colleges with tuberculosis programs available, mostly on a voluntary basis, to faculty members and administrative employees. Now there are forty-nine schools so listed.

Annually we note a gratifying shrinkage in the number of colleges where positive reactors have roentgenograms taken once only during their course. There is a coincident increase in the number where films are made annually, or oftener if indicated. There are no less than thirty-six schools using the fluoroscope as a supplement to chest films, while only five still employ the screen as their sole roentgenographic diagnostic aid. The inherent dangers in relying exclusively on the fluoroscope for diagnosis, particularly of the early lesions, have been pointed out, although we believe fluoroscopy of infinite value in rectifying the obvious shortcomings of the static, single-flat-film routine investigation. Those men who report the most outstanding results through use of the fluoroscope, almost unanimously stress their coincident reliance upon good serial films.¹⁴ It is only the use of an inadequate screen or the use of a good machine by an improperly prepared examiner that we hope to see avoided. The newer technic of minicamera snap-shots of fluoroscopic images is too recent for us to do more than mention as another medium to be carefully evaluated. If it fails to discover a reasonably complete number of the *minimal* cases now found by older methods, its cheapness and rapidity can hardly justify its substitution for those technics. Primarily, it is to be hoped that we who wield any weapon, whether it be tuberculin test, chest film, fluoroscope, blood count, sputum examination, sedimentation rate, serological reaction, or anything else in the clinician's armamentarium, will be equally as quick to appreciate and acknowledge its limitations as to claim and publish its advantages.

Student positivity to tuberculin has been indicated as now lying at about the level of 30 per cent when we restrict our consideration to those

who received adequate dosage. This is probably a fair average for the country at large within the age-group tested and within a social stratum comparable to the rather selected, favored, student mass. Unfortunately, our earlier figures are not as conclusive as those compiled latterly, but they were reasonably correct. Thus, when we note that in 1932-33 the national college returns showed 35 per cent positive reactors, we believe it is fair to presume a gradual decline in the incidence of tuberculous infection is in progress among students as it is elsewhere in the general population. Further annual surveys by the Committee are necessary, however, before any definite rate of improvement can be computed.

As found by investigators outside the college field, we likewise determine that, at a given age, a slightly higher percentage of men than women will react to tuberculin, though there is definitely a slightly higher ratio of active tuberculosis found among the women students.^{4,5,11,14} Again, with few schools yet possessed of record systems capable of supplying exact information, it appears that well less than 1 per cent of all tested will be found to have demonstrably active pulmonary tuberculosis. In the mid-West it is probably not over half of one per cent, or well below 2 per cent of those submitted to x-ray. Stiehm, at the University of Wisconsin, has shown that evidence of infection subsequent to entrance to school is relatively more to be expected than that found at entrance examinations, but that with modern methods it is possible to limit the probability of discovering moderately or far advanced cases of tuberculosis among old students almost to the vanishing point. Prior to 1933, at that university, using methods based on investigation of students with symptoms or signs, namely, sick patients, an average of ten cases of tuberculosis per year came to be diagnosed.¹² Most were well past the minimal stage. During the first five years of a case finding program beginning that year, only three of the seventy-one active cases discovered had reported because of symptoms.¹⁴

The well known rise in the incidence of tuberculous infection with advancing age is brought out in our national figures that reveal students of age 17 to average 20.5 per cent positive reactors, those of age 21 about 26 per cent, those of 25 around 35 per cent, and those few above

35 years approximately 66 per cent positive. The marked increase in infection rate among students of medicine and nursing is universally recognized.^{1,6,11} This has ranged as high as 96 per cent positive among the seniors of one Eastern medical college. The findings in Minnesota have been ably presented to you in the past by Boynton, Myers and others.¹ We must regard such professional courses of study as within a definitely "special hazard" class, where they must remain so long as there are known or unknown tuberculosis patients to be nursed and treated. The necessity for minimizing hazards through improving every technic designed to prevent infection or re-infection of students should be obvious.

Adding the examination of fasting stomach sediments to the other procedures for studying suspected cases has largely overcome the problem of the sputumless or uncoöperative patient. Stiehm reports detection of tubercle bacilli in gastric specimens from 72 per cent of those who had negative or no sputum, when reinforced by guinea pig inoculation.¹³ At Carleton College the only clinically suspicious case we found this year was corroborated from a bacteriologic standpoint only through use of this device. It is to be hoped that laboratory facilities here and elsewhere may soon permit such vital examinations to be freely available whenever needed.

Up to this point we have dealt with methods. Let us now scrutinize results. Figures for 1937-38 and for 1938-39 are almost identical in their proportions and absolutely without variation as to what they teach. They indicate one fact only: that tuberculosis can be found, and found early, by anyone willing to look for it with his clinical eyes open. Tuberculosis is missed, or found only upon rare occasion and purely incidentally by physicians or institutions pursuing out-dated methods. For example, last year in those 165 colleges supporting case finding, enrollment totalled 348,713 students. Determined search for tuberculosis turned up 241 clinically active cases, with 368 others diagnosed as apparently arrested, or, in all, 609 newly found cases of the disease. Of these, 151 students withdrew from college because of their lesions. There were, additionally, 320 old cases not included in the above, back in college under supervision. Bearing these figures in mind, let us consider the situation with regard to 129,851 students enrolled in 117 col-

leges answering the questionnaire, but not yet blessed with case finding facilities. Here, by one means or another, somebody, somehow managed to diagnose four cases as clinically active, fifteen others as apparently arrested, while there were ten formerly diagnosed cases back in school. Only four cases left college because of tuberculosis. In the first group of colleges the protected, investigated student population was considerably less than three times the volume of that in the second group, yet its active cases found were sixty times as numerous, and those advised to leave college for their own good and for the safety of others were thirty-eight times as many.

Should a student introduce smallpox or poliomyelitis to a college campus, events would move fast! Not only would he be isolated and properly treated, but instant search would begin for the source of his infection. His local health officer would be notified, and all the machinery of public health would be set in motion to prevent an epidemic. Something of this attitude must be transferred to tuberculosis work if we are to profit fully from the effort being expended to discover cases among students. We now know a positive reactor is nothing less than an infected human being, yet we are apt to go no further than careful examination of that one individual to determine if he is in need of care, or if he can spread his tuberculosis. Although it would entail a tremendous amount of work if a system of back-tracking as thorough and exhaustive as our present process of follow-up were to be supported, we must give earnest thought to this side of the problem if we are hoping for elimination of tuberculosis from the whole population. Since we know that most infections in early childhood are traceable to the home environment, later ones to a widening and more elusive circle of contacts, we are doing only a partial job when we fail to enlist the aid of relatives, family doctors, and local tuberculosis and social agencies in ascertaining where in his own community a student may have picked up his tubercle bacilli. Frequently the search might be unavailing, but there can be little doubt that many instances of unrecognized, open tuberculosis would be located in this way. Another challenge for the future is to buttress the present college case finding with pre-college programs such as we have in many progressive districts already, and with post-graduation technics on at least as high a plane

as those enjoyed by the student while in college. Instead of filing and making a cold statistic of the clue provided by every positive tuberculin reactor, we should seek ways and means of passing it on to those of our associates best able to utilize it in strengthening public health efforts against tuberculosis.

Before concluding, an appeal should be issued to physicians in general and to tuberculosis specialists in particular to coöperate with the student health doctors who are attempting to popularize a campaign built around the words "early" and "preventive." The fact that the great majority of tuberculous patients (70 to 80 per cent of entering cases) still approach sanatoria when well beyond the minimal stage, their hospitalization prolonged, their prognosis greatly modified, their personal and public economic loss magnified, their rehabilitation complicated, testifies to the task that confronts us all before most or all cases can be diagnosed and treated early and hopefully. It is axiomatic that every far advanced case, every fatality, was once a minimal case, probably remaining so for a considerable period of time, but it is just as obvious that minimal cases must be going unrecognized seven or eight times out of every ten. The discouraging phase of the problem to the student health physician lies in the fact that all too often family doctors and internists alike, together with a certain number of those devoted exclusively to tuberculosis practice, are apt to belittle or grant scant attention to the preclinical, symptomless case once it has been found. On the same unfavorable side of the ledger appear those patients prematurely allowed to resume activity. These are usually people who become impatient, or whose medical adviser may still be living among the concepts of tuberculosis taught in medical schools of his day and not brought up to date. Or, perhaps, beds are needed for more of those neglected, late-diagnosed cases that represent stimulating surgical challenges as opposed to the minimum measures necessary to restore to health the early-identified cases.

If some college physicians are open to the criticism of being overly enthusiastic and active in the direction of early diagnosis and prompt, unhurried treatment, they surely are erring on the safe side. It would be just as easy to observe that occasionally some very eminent specialists concentrate too much time and effort, proportionately, on the very thing they publicly deplore—the late manifestations of tuberculosis. So, too, many otherwise up-to-the-minute general practitioners doggedly prefer symptoms to search, stethoscope to x-ray film. Somewhere in between two wide extremes is the level of common-sense coöperation, aided by lay education, upon which we should all be laboring shoulder to shoulder to defeat an ancient enemy—tuberculosis.

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EARLY DIAGNOSIS CAMPAIGN—THE RURAL HENNEPIN COUNTY PLAN*

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SOME one—was it the currently popular Chinese savant—has said, "It is as dangerous to recall a prophesy as it is to loan money to a friend." Nevertheless, on the eve of the Annual Early Diagnosis Campaign there may be some profit in looking backward to 1904 when the National Tuberculosis Association, with the courage and zeal characteristic of all young crusaders, announced as its objective, "No Tuberculosis by 1915." The thirty-six years of continuous effort in tuberculosis control since then have taught us the futility of that early shibboleth. But at the time it was made there was already in the world assurance of its ultimate accomplishment.

Leprosy, the dreaded plague of the Middle Ages, a disease which had instilled in human beings a fear without parallel in medical history, had been driven from Central Europe in two hundred years by merely isolating the leper in some of its nineteen thousand monasteries. If Europe in the Middle Ages, without decent sanitation, without cleanliness or public health protection of any kind, could conquer the terrible plague of leprosy, then surely the United States through the isolation of the tuberculous in sanatoria could expect to control tuberculosis—and it ought not to take more than eleven years to accomplish it. At least so thought the founders of the National Tuberculosis Association.

In their minds the problem was comparatively simple, merely locate the cases of tuberculosis in the early stage of the disease, before they had become infectious to others and treat them in a sanatorium.

This seemed an excellent plan and one to which an eager nation gave unexpected response through the purchase of Christmas Seals and the passage of laws setting aside public funds for the construction and maintenance of sanatoria.

But in all this planning they forget that leprosy is on the skin and easily seen while tuberculosis is hidden deep in the lungs and therefore is more

difficult to detect. Perhaps that is why the plan did not work out as has been anticipated, for the patients who came to the sanatorium were in the advanced rather than the early stage of the disease.

In the United States right now, according to the most recent survey of the American Medical Association, there are 202,021 persons under treatment for tuberculosis, in public and private institutions, the maintenance of which represents an annual expenditure of over seventy million dollars. In some communities there are between three and four beds per death and today vacancies are occurring in some of our once crowded institutions.

To derive the maximum benefit from these facilities an active early diagnosis campaign is imperative. For in the words of the late Dr. David A. Stewart, "Known tuberculosis can be made partially safe but when it is unknown and therefore not being taken care of, it is always dangerous."

It was to find this unknown case that the Wisconsin Anti-Tuberculosis Association began its diagnostic campaign in 1918 or 1919 which has been so successfully carried out during the years since. To be sure, in this interval, the emphasis has shifted from an educational campaign and a chest examination of the sick person to the study of the apparently well person through the use of the tuberculin skin test and chest x-ray. Thus, while the objective of the early diagnosis campaign remains the same, its methods have been modified.

Because of your own well-organized plan of searching for the unknown case, discussing the early diagnosis campaign before this group is like "carrying coals to Newcastle." Nevertheless, I think you may be interested in the country-wide search for the unknown case as carried out in rural Hennepin County. This is a coöperative program participated in by the Hennepin County Tuberculosis Association, the Glen Lake Sanatorium and the private physician who reports his findings to us.

This coöperative survey includes two groups:

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first, the school child and his adult contacts both in the school and in the home; and, second, the contacts of the new cases of tuberculosis reported to the Health Department.

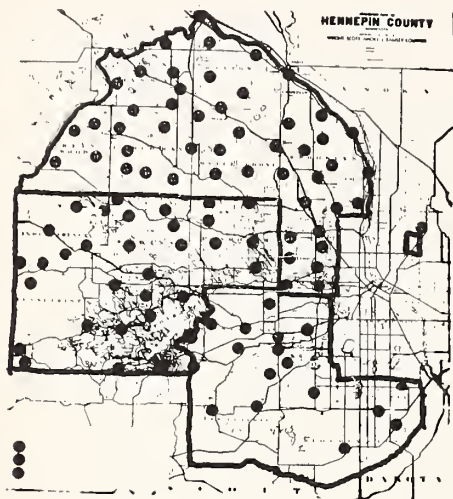


Fig. 1

To carry out the survey of the school child and his contacts, the county is divided into three parts and one part is tested each year. It takes three years, therefore, to cover the county and on the fourth year we begin all over again. The accompanying chart shows the division of the county and the location of survey centers (Fig. 1).

The work itself has two phases: (1) educational or publicity, which is directed by the Hennepin County Tuberculosis Association, and (2) medical, directed by the Sanatorium but including the private physician.

The Tuberculosis Association in its educational work contacts the schools and through talks before parent-teacher associations, letters signed by the County Superintendent of Schools, and personal work of the nurses, sells the idea of a school survey to the parents and the school employees. This publicity is very important because upon its effectiveness in securing signed cards of consent for the tuberculin skin test depends the success of the survey as far as it pertains to the number of children, school employees, and adult contacts studied.

This coöperative program was begun in rural Hennepin County in 1925. At first the positive reacting children and school employees were sent to the Sanatorium for their roentgenograms. But

by 1932 it had become apparent that this was not a satisfactory method and since then, with the approval of the Hennepin County Medical Society, we have been using a portable x-ray machine which can be set up in the schools. In approving the use of the portable x-ray machine, the Medical Society requested that the family physician be informed of any abnormality found. This we gladly agreed to do and since then we have been most careful in following out that agreement.

This is a very excellent arrangement because it enables us to take films of the household contacts at the same time with the positive reacting children and the school employees. The technicians who do this work have taken as many as 650 x-ray films in one day and can easily take about sixty an hour.

Table I shows that the publicity work has been carried out very effectively.

TABLE I. SURVEY WORK IN RURAL HENNEPIN COUNTY

	1935	1936	1937	1938	1939
Percentage of school children in district who were tested	82.7	54.3	82.8	92.2	84.9
Percentage of those tested who reacted positively....	24.4	24.4	23.3	18.1	21.6
Percentage of positive reactors who had x-ray films	94.0	64.5	95.0	97.1	94.1

With the exception of the year 1936, when a special situation occurred which will not repeat itself, we were able to secure consents for the tuberculin testing of from 82.7 to 92.2 per cent of the school children enrolled in the district surveyed. The percentage of positive reactors in the district varied from 18.1 to 24.4 per cent although in some of the one room schools there were no positive reactors.

We have often wondered why parents refused to have their children tuberculin tested. In investigating one such group we found that in every instance the State Board of Health had a record of tuberculosis in families with the same given name and surname of the parents and children as in our group. In some of the families our records included other children, born since the original record has been made. As the addresses of the families were different, the State Board of Health would not state definitely that these were the same families but it would seem quite a coincidence if they were not. It is logical to assume that when tuberculosis was diag-

nosed in these families, they moved into a new community where their neighbors would know nothing about it and because of this they refused to have their children tuberculin tested. Of course this may not be the sole reason why parents refuse to have their children tested but it may be one of the most important reasons.

The next step in the program is to take x-ray films of the positive reactors and during the years under consideration we were able to do this, again with the exception of 1936, in from 94 to 97 per cent of the positive reacting children (Table I). No x-ray films are taken of the younger children until they enter the teen age. Those in the teen age have a film taken yearly. How important this x-ray examination may be at times is illustrated by the story of I. K. who was the son of one of the bankers in rural Hennepin County. He was very active in the extra-curricular life of the school, played in the band, was on the basketball team, and seemed to enjoy life thoroughly. His tuberculin test was positive and as he was afraid that some of his pleasures might be curtailed if anything was found on the x-ray film, he refused to have this examination made. When he entered the University two years later he was roentgenographed along with the other freshmen and advanced disease was found. He was then admitted to the sanatorium and remained there almost seven years, but it was too late and he finally died. The delay in diagnosis cost him his life. This story is not unique; every sanatorium has duplications of this tragic record.

The forest ranger looks upon smoke in the forest as an indication of a fire. In the same way we look on the positive tuberculin reaction in a child as evidence that the child has been in contact with an open case of tuberculosis. Our problem, then, is to find this contact if possible. The child's contacts, who fortunately are rather limited, can be divided into two broad groups, school contacts and the household contacts.

(a) *School Contacts*.—Because of the community's interest in this program, and the excellent coöperation of the various boards of education, we have been able to tuberculin test or roentgenograph from 60.2 to 90 per cent of the school employees. I hope the time is not too far distant when public opinion will require of teachers annual evidence of freedom from tuberculosis as determined by a chest film before they

begin their work in the fall. I realize that contracts are signed in the spring and therefore my suggestion may create quite a problem, but I believe it can be solved.

(b) *Household Contacts*.—This group consists of any one, school child or other persons fifteen years of age or over living in the home. Aside from those in school and those who may be checked by their family physician our study of this group is limited to an x-ray and sputum examination if there is any sputum. The x-ray examination is made at the school at the same time that school employees and children are having films taken.

In spite of the fact that this x-ray service is furnished at the expense of the taxpayers and only requires one trip, we have been able to secure films on only from 47.5 to 69.5 per cent of this group. If it were not for the children over fifteen years of age who have films taken as part of the school survey, the percentage of household contacts examined by x-ray would be considerably less.

It is a curious commentary on human nature that people who are willing to have their cattle tested for tuberculosis apparently resent the suggestion that somebody in their household might be the cause of the infection of their child. This attitude is well illustrated by the story of a young girl who was over-weight for her age but whose tuberculin test was positive. The mother assured the nurse that she and her husband were both free from tuberculosis and could not be the source of infection. Upon further questioning the nurse found that the father had a cough. The mother thought it was due to the fact that he was an engineer and got very warm in the boiler room and then went outside to cool off. After much persuasion the father underwent x-ray examination and he was found to have moderately advanced tuberculosis. Prompt treatment in a sanatorium restored his health.

It seems to me that our next step should be to devise some means of securing better coöperation from this group of contacts. For various reasons this is most difficult at times.

The last group studied is that of the contacts of the known cases of tuberculosis who are reported to the State Board of Health (Table II). Our nurse calls on the physician, who made the original report, to offer the help of the sanatorium in having the household contacts of his

TABLE II. SURVEY WORK IN RURAL HENNEPIN COUNTY

	1935	1936	1937	1938	1939
Percentage of employees in schools surveyed who were tuberculin tested or roentgenographed	60.2	35.8	71.4	90.0	87.9
Percentage of adult household contacts tuberculin tested or roentgenographed			47.5	69.5	63.0
Percentage of household contacts of new cases reported to the Health Department tuberculin tested or roentgenographed			81.4	83.2	80.2

patient examined. He may want to examine them himself. If so, the nurse gives what assistance she can in persuading the other members of the household to go to his office for a check-up. If he wants us to examine them, we do so. Even though this study has been going on only three years, we have been able to tuberculin test or x-ray from 80.2 to 83.2 per cent of the household contacts of the known cases.

So far we have merely described our methods. Now for the results.

According to Tables III and IV, it is apparent that except for 1939, more cases of adult tuberculosis have been found by surveying the school child and his contacts, both in the home and in the school than have been found among the household contacts of the new cases of tuberculosis. In 1939, however, we found five cases of adult tuberculosis among the contacts of one known case (Table V).

These were all found in one family consisting of a father and mother and seven children who ranged in age from thirteen to twenty-three, one of whom, a twenty-three year old son, was found to have active tuberculosis. When the rest of the family was tuberculin tested, two of the children, a thirteen year old girl and a seventeen year old boy, were considered to have positive tuberculin tests. In both, the original x-ray examination was negative. It is still negative in the girl. But a lesion was demonstrated in the seventeen year old boy on a subsequent x-ray film. He is now a patient in the sanatorium.

The tuberculin test of the other four children, one boy and three girls, was considered negative and they were all told that because of the negative test they could not possibly have tuberculosis. The first x-ray film of the oldest one, a twenty-three year old girl, was negative and sub-

TABLE III. NEW CASES OF ADULT TUBERCULOSIS DISCOVERED BY THE SURVEY IN RURAL

HENNEPIN COUNTY

Calendar Years 1935-1939

	1935	1936	1937	1938	1939
1. School Survey					
Examined by test or x-ray					
or both	2385	3196	4636	6234	5974
Children	2166	3012	3993	4976	4757
Adult tuberculosis....	2	0	1	4	1
Inactive	1	0	1†	1	1
Activity questionable..	1*	0	0	3	0
Employees	67	70	150	219	294
Adult tuberculosis....	1	1	2	2	1
Inactive	1	1	0	1	1
Activity questionable..	0	0	2	0	0
Active	0	0	0	1	0
Adult contacts	152	114	493	1039	924
Adult tuberculosis....	4	1	13	11	10
Inactive	3	1	12	11	9
Activity questionable..	1	0	1	0	0
Active	0	0	0	0	1
2. Survey of Household Contacts of Known Cases of Tuberculosis					
Known cases			32	43	42
Total household contacts			113	143	116
Number of contacts tested or x-rayed			92	119	93
Adult tuberculosis			0	0	5
Inactive					1
Active					4

(In addition, as a result of our work in 1938, an adult contact was x-rayed by a private physician and was found to have active adult tuberculosis and was admitted to the sanatorium. In 1939 two old cases of adult tuberculosis were "rediscovered" and admitted to the sanatorium.)

*Admitted to the sanatorium and discharged in 1937 as childhood tuberculosis apparently arrested.

†X-rayed again in 1939 and all plates were re-read as negative.

TABLE IV. SUMMARY

New Cases of Adult Tuberculosis Discovered by Survey in Rural Hennepin County

	1935	1936	1937	1938	1939
1. School Survey					
Children	2	0	1	4	1
Active	0	0	0	0	0
School employees	1	1	2	2	1
Active	0	0	0	1	0
Adult contacts	4	1	13	11	10
2. Household Contacts of Known Cases			0	0	5
Active			0	0	4

sequent films are still negative. In one of the remaining girls the original film was negative but subsequent ones showed evidence of tuberculosis. This girl is now a patient in the sanatorium. The original films of the remaining boy and girl were both considered positive. The boy is now a patient at the sanatorium. The girl is still at home even though her last film shows a spread.

While these four cases were discovered as a

EARLY DIAGNOSIS CAMPAIGN—MARIETTE

TABLE V. CASE STUDY

Father: Negative x-ray.

Mother: Bilateral — upper lobes both lungs—more marked on right—apparently inactive.

G	L	Et.	El.	R	W	E
23 yr. old female	22 yr. old male	20 yr. old female	19 yr. old female	17 yr. old male	16 yr. old male	13 yr. old female
Tuberculin test negative	Cold, Fall of 1938	Tuberculin test negative	Tuberculin test negative	Tuberculin test positive	Tuberculin test negative	Tuberculin test positive
X-ray—March negative	Tuberculin test negative	X-ray March 1939 negative	X-ray March 1939 showed bilateral tbc. left 4th I. S. right 3rd & 4th ribs, anterior	X-ray in Feb. 1939 negative	X-ray in Feb. 1939 positive	X-ray in Feb. 1939 negative
Still negative Oct. 10, 1939	Diagnosed as pneumonia on Dec. 16, 1938	X-ray June 27, 1939 positive, showed early lesion	X-ray in May showed spread	X-ray in June 1939 showed early lesion	Admitted to Sanatorium April 16, 1939	Still negative Oct. 10, 1939
	Hemorrhage Dec. 29, 1938 Positive sputum	Admitted to Sanatorium July 23, 1939	Still at home	Hemorrhage Feb. 9, 1940		
	Admitted to Sanatorium Dec. 30, 1938			Admitted to Sanatorium Feb. 9, 1940		

result of a survey of the contacts of a known case of tuberculosis, it is within the realm of probability that they too could have been discovered as a result of the school survey if the parents had permitted us to tuberculin test the children when their school was surveyed. But the parents always told the nurse that there was no tuberculosis in their family and so refused to have the children tested.

The father's film is negative but the mother's shows scars of bilateral disease which is apparently inactive. She is the fifth case. Her history is interesting. She had what was thought to be pneumonia twenty-two years ago when her second child was about six months old. The nurse who cared for her at that time died of tuberculosis about a year and a half later. Also, about seventeen years ago a hired man died of tuberculosis within a year or two after leaving the farm. About thirteen years ago the mother's brother died of tuberculosis at the age of forty-two but his contact with the children was very casual and infrequent. Was the mother's pneumonia of twenty-two years ago tuberculous and has it left a long trail of infection and disease in this family? Was it responsible for the death

of the nurse, the hired man and possibly her brother?

The first x-ray films of some of the household contacts were interpreted as negative but disease was discovered in subsequent films. This illustrates the value of periodic x-ray examinations in following contacts.

Please do not misunderstand me. These statements concerning the finding of active tuberculosis when the original x-ray film was considered negative or in the presence of a tuberculin test which has been interpreted as negative are not made to disparage either x-ray examination or the tuberculin skin test. They are made for two reasons, one, to call your attention to the fact that because of variable human factors there is in my opinion no one test which is so infallible that when it is negative upon one application tuberculosis can be definitely ruled out. Also, I believe that the diagnosis of early tuberculosis should consist of far more than a bottle of tuberculin and an x-ray machine. It should include a thorough study of the individual in which all of the evidence is weighed. If there is anything to suggest tuberculosis, a thorough examination including a tuberculin skin test, an x-ray and a sputum examination, should be made.

TABLE VI.—TUBERCULOSIS MORTALITY FOR YOUNG MALES AND FEMALES

Registration States of 1900, 1900-1935 (Nicholson)

Year	15-19 years			20-24 years		
	Rate per 100,000 pop.		Excess of Female over Male Rate	Rate per 100,000 pop.		Excess of Female over Male Rate
	Male	Female		Male	Female	
1900	124.1	177.7	43%	249.7	265.8	6%
1910	111.1	133.0	20%	190.9	204.0	7%
1920	79.0	131.6	67%	137.9	179.4	30%
1930	37.4	67.3	80%	76.6	103.6	35%
1935	24.2	44.1	82%	53.8	76.2	41%

My second reason is to call your attention to the fact that in all crusades, and the battle against tuberculosis is a crusade, the pendulum always swings too far. Witness the first surge of building preventoria. One state went so far as to build preventoria for children who were considered to be predisposed to tuberculosis if they happened to be fifteen per cent underweight, while it did not have enough beds to care for all of the open cases. Now the correction has set in and some want to abolish preventoria altogether. In time we will find the proper balance. Because of the tendency to over-correct, we have not closed our preventorium. So too the pendulum has swung too far in the tuberculin studies. In time that will be correctly appraised and it will become generally recognized that active tuberculosis can exist in people who are in fairly good condition in spite of the fact that the tuberculin test is negative.

It is the accepted belief that more tuberculosis can be discovered through a study of the contacts of the known cases than through a study of the contacts of the positive reacting school child. Our studies do not support this belief. I have no explanation to offer as to why more tuberculosis was found as a result of the school survey unless it be that we are dealing with families in a mixed rural and village community. If these families have school children in contact with open cases of tuberculosis, these children should lead us to the open case of tuberculosis before he becomes sick enough to consult a physician.

One group not yet included in our study is that of the industrial worker. It is very probable

that surveying the industrial contacts of known cases of tuberculosis may be more productive of new cases than the contacts of the school child.

The early diagnosis of tuberculosis among adolescents is very important and warrants a special study.

According to Table VI it is apparent that the death rate among girls is higher than among boys. Some have attributed this difference to the dietary fad which girls adopt to attain that ideal figure and to their ideas of modern dress. But this condition has existed since 1860 in England and Wales and since 1900 in this country, and present-day ideas of dress and diet did not prevail then. Therefore, these cannot be the primary cause of this condition. It must be something else and the logical conclusion is that it is due to biological factors.

While biological factors might be the cause for the slight excess in the death rate for girls as compared with boys for 1900 and 1910, they could not account for the sharp jump in the excess death rate for girls between 1910 and 1920 and from then on. One explanation is that in this decade following the World War more women went into industry and tried to compete with men in their manner of life and work. Whether that represents cause and effect or merely coincidence, one cannot tell.

Figure 2 compares the death rate according to sex and age. From fifteen to thirty-five the death rate for females is higher than for the males with the peak occurring in the five year period between twenty and twenty-four years of age.

This coincides with the period of woman's greatest fertility and after that the death rate declines rather markedly. At fifty it begins to rise. The death rate for males reaches its peak in the seventy to seventy-four years of age period. From about eighty years on, both the males and females have approximately the same death rate.

In a report summarizing the results of treatment of the teen age individuals, Chadwick quotes Morgan who summarized the condition in 1938 of 320 children ten to eighteen years of age who had been treated at the Westfield State Sanatorium between 1920 and 1938. He reports that of this group, 62 per cent are dead, 14 per cent under treatment, and 17 per cent are well,

and only 7 per cent could not be located. The treatment used generally was prolonged bed rest supplemented by an occasional pneumothorax.

Chadwick also referred to a series of 55 boys

which, as far as tuberculosis is concerned, centers about contagious technique to prevent or reduce the massiveness of infection, and frequent x-ray examinations to detect tuberculosis before it has had a chance to develop very far.

But there is no unanimity of opinion as to what constitutes adequate contagious technic for acute disease hospitals let alone for the tuberculosis hospitals. Certainly if contagious technic alone is adequate then we should be able to agree on the type of technic which will best prevent transmission of infection from patient to nurse. But from studies made at different hospitals where different types of technic are used, it is apparent that the more elaborate technic is no more effective than the less elaborate technique. No technic that I have heard of is "foolproof." Therefore, some other means should be found to give the nurse added protection. If so, what more is there to do unless it be vaccination?

In that connection, evidence is gradually accumulating to indicate that a tuberculin positive nurse develops tuberculosis much less frequently and much less severely during training than does the nurse who was tuberculin negative when she began her training.

That raises the question—why is the tuberculin negative nurse not vaccinated with B.C.G. and thus made tuberculin positive with a non-virulent strain of tubercle bacilli? If this were done she would receive the same type of protection to enable her to care for the tuberculous that the non-immune nurse receives before she cares for other communicable diseases.

Some claim that not enough is known about the safety and the efficacy of B.C.G. to warrant its use. But evidence is also gradually accumulating to indicate that the tuberculin negative nurse who becomes tuberculin positive after vaccination with B.C.G. has almost as much immunity as the nurse who was tuberculin positive at the beginning of training. Furthermore, numerous investigators report that B.C.G. is safe. For instance, Kayne, in 1936, stated that if all the reports of disease which occurred in the 1,343,000 infants vaccinated with B.C.G. could be proved due to the vaccination, the ratio of tuberculous deaths would be less than one in 15,000.

In 1938 Asfora and Livramento of Brazil analyzed the reports of vaccination with B.C.G. and concluded that it is safe in that the morbidity and mortality rates are about one-third

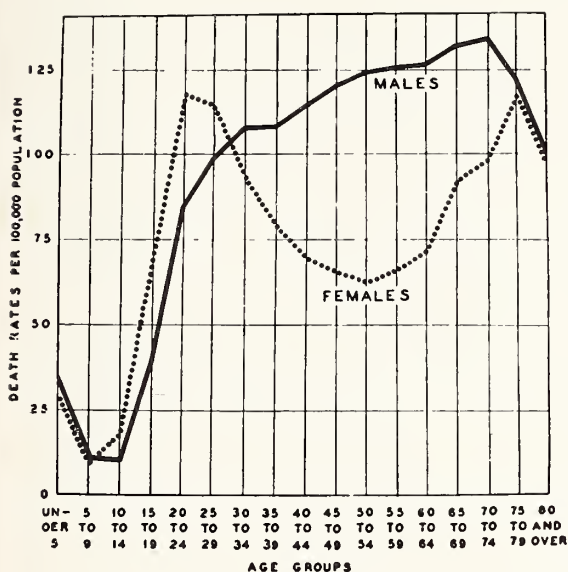


Fig. 2

and 131 girls reported by Zachs. Of the group that received routine sanatorium treatment, 30.9 per cent of the boys were dead and 34.4 per cent of the girls. However, in the group that received collapse therapy in addition to routine treatment, only 8.5 per cent of the boys were dead and 23.1 per cent of the girls.

Chadwick in a similar study at the Middlesex County Sanatorium covering a five to ten year period where 50 per cent of the group received pneumothorax, reported that 4.8 per cent of the boys were dead and 21.7 per cent of the girls.

This would also indicate that the problem is greater among the girls than it is among the boys and would suggest that the high schools might be a very fertile place for an intensive early diagnosis campaign.

Another group where the early diagnosis of tuberculosis is important is that of the sanatorium hospital personnel, particularly those who come in close contact with the patients.

Because of the greater exposure to tuberculosis and infections in general which accompany close contact with the sick person, it is imperative that whatever disease may develop in this group should be detected early.

To that end many hospitals have set up planned health services for their employees

as great in the vaccinated group as in the non-vaccinated group. Because of that he concludes that vaccination with B.C.G. is one of the strongest weapons in the battle against tuberculosis.

Thus, an impartial analysis of the literature gives rather good evidence of the protection afforded by a positive tuberculin reaction whether acquired naturally or as a result of vaccination with B.C.G. This analysis also indicates that B.C.G. is safe.

In spite of this, hospital authorities seem to consider that contagious technic will afford the tuberculin negative nurse all the protection she needs in the prevention of disease as a result of spread of infection from patient to nurse. Yet in all other communicable diseases the hospital authorities consider that contagious technic alone is inadequate and insist that the non-immune nurse be vaccinated or immunized before beginning this service. If contagious technique alone does not afford adequate protection for the non-immune nurse in the care of smallpox or scarlet fever, why should it be considered sufficient to protect the tuberculin negative nurse in the care of tuberculosis?

The converse is also true. If immunization afforded the nurse all the protection she needed against infection which was transmitted from patient to nurse, then there would be no need of her using contagious technic. Her vaccination would render her immune even to massive infection. But we know that if the dose of infection is great enough, it can break down any resistance which may have developed as a result of immunization against any communicable disease.

Thus, because neither contagious technic alone, nor vaccination or immunization alone gives the nurse adequate protection in the care of these diseases, hospital authorities insist that the nurse combine vaccination or immunization with contagious technic. What right have we to expect more protection from the use of contagious technic in the care of tuberculosis than in the care of other communicable diseases?

If vaccination with B.C.G. does nothing else, it produces a primary infection with an organism of low virulence so that the hematogenous spreads associated with massive primary infections which appear later as lesions of extrapulmonary tuberculosis would be avoided. But

from the evidence found in literature I am convinced it does far more than that.

Therefore, I look forward to the day when the hospitals in the United States will adopt the policy so prevalent throughout Norway, Sweden and Denmark where all of the tuberculin negative nurses and other hospital employees are vaccinated with B.C.G.

In this way, we can give the tuberculin negative nurse who is caring for tuberculous patients the same type of perfection that the non-immune nurse has in the care of other communicable diseases, namely, vaccination or immunization plus contagious technic.

In closing, I want to sound a note of encouragement and of warning. Encouragement in that tuberculosis is declining throughout the entire world more rapidly some places than others but still the trend is downward. Warning that we do not become too complacent and too self-satisfied over this decline. With the reduction in tuberculosis which must accompany such a reduction in the death rate, it will become more difficult to find the unknown case and find it we must for, in the words of Dr. Stewart, "The unknown case is dangerous." Thus, the importance of the early diagnosis campaign increases.

We must sharpen our tools or find new ones for the tremendous task which still remains to be done. In 1940 in the United States about 70,000 people will die from tuberculosis and about 500,000 or enough to populate a city about the size of Milwaukee will be made ill by it. So you see there is a great deal to do before we can rest secure in our belief that tuberculosis has been controlled.

We think our future efforts should center about the following: (1) an intelligent education of the public; (2) a thorough search for the open case of tuberculosis who may be infecting others; (3) securing adequate sanatorium facilities in communities which lack them; and (4) vaccination with B.C.G. of nurses, doctors, and other hospital personnel who come in intimate contact with known or unknown cases of tuberculosis and thus are unavoidably exposed to tuberculosis in their line of duty.

Education should be directed towards training the public consciousness to consider health a positive and priceless possession to be safeguarded through constant alertness. If that day ever

(Continued on Page 494)

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN WINONA COUNTY

(Continued from June issue)

Biographies

Mrs. Lou Finch practiced as a physician at Winona City. She came in 1872 and boarded at the Riverside Hotel.

John D. Ford was born at Cornish, New Hampshire, April 18, 1816. He graduated at Dartmouth College, and subsequently from the Jefferson Medical College (1844). Soon afterward, he commenced the practice of medicine at Norwich, Connecticut. While a resident of Norwich he was interested in the educational institutions of that city, and labored earnestly in behalf of its common schools. After a successful practice of about eleven years, he was compelled to seek a climate more congenial to his health, and came to Winona in 1856. His practice was extensive. After May, 1862, he associated himself with Dr. F. Staples. Dr. Ford gave up his practice not long after that, because of poor health. In 1859 he had become the agent for the Norwich Fire Insurance Company of Norwich, Connecticut, and later he was the agent of several other eastern insurance companies. He established extensive relations between these companies and the citizens of Minnesota.

Dr. Ford held several public offices during his stay in Winona. He was elected alderman in March, 1857. In November of the same year, he is mentioned as chairman of the trustees of the school districts, and retained the office in 1858. In March, 1860, Dr. Ford was elected one of the directors of the State Normal School. Three years later, he was appointed school examiner for the second district by the Board of County Commissioners. In the same year he became government pension surgeon for Winona.

Dr. Ford died in Winona of typhoid pneumonia on November 5, 1867. He may well be considered a pioneer in the interest of the common school system of the city and state. His son, Guy Stanton Ford, is President of the University of Minnesota.

George L. Gates, M.D., was born in Harwington, Litchfield County, Connecticut, December 4, 1837. In early life he was taken to Cortland, New York, where he received his academic education and then studied medicine in a physician's office. In the spring of 1855 he came with his family to Saratoga township in Winona County. He remained on the home farm until the outbreak of the Civil War. He enlisted in the volunteer infantry in 1861. During the last months of his three-year service, he was an assistant in the ambulance corps. After returning to Saratoga for a few years, he entered the medical department of the University of Pennsylvania in 1869. He then spent two years in practice with his cousin, Dr. H. A. Balles, at Cortland, New York. In 1872 he opened an office in Caledonia, Houston County, Minnesota. In 1880 he came to Winona where he prac-

ticed for many years. He became a member of the county, state, and American Medical Associations, and belonged to several fraternal orders in Winona. Dr. Gates practiced under the exemption law.

Charles M. Gernes came to Winona in 1878, or before. He was a Hollander. Judging from available reports, Dr. Gernes did not practice medicine in Winona, but engaged in farming and the grain business. He had a farm near Saint Charles in 1878 but did not live there.

J. Gilchrist, M.D., homeopathic physician, opened an office and started practice in Winona in 1860. His card published in 1866 read:

J. GILCHRIST, M.D.

Homeopathic Physician (Late surgeon to Phila.
College Dispensary). Office hrs. 7 to 9 A.M.—
1 to 2—5 to 7 P. M. Office in the brick bldg. on
3rd st. below Huffs Hotel.

(See Steele County)

O. F. Gile, physician, practiced at Pickwick in 1878-1879. Later, between 1883-1890 he practiced at Dakota. Dr. Gile had an exemption certificate.

Arnold P. Gilmore came to Winona soon after his graduation from the Jefferson Medical College in 1874. During his stay in Winona, he was an instructor at the Winona Preparatory Medical School. In 1876 he became a member of the Winona County Medical Society, and in 1878, a member of the State Medical Society. He was considered a highly educated and skilled physician, and made a specialty of diseases of the eye, ear, and throat. In 1879 he moved to Chicago.

A. Gray was a doctor at Utica. He died in 1863.

H. C. Grover graduated at the University of Iowa in 1855. In 1881 he was practicing at Rushford. Later, he became a member of the Winona County Medical Society.

H. H. Guthrie graduated from Rush Medical College, Chicago, in 1863. He came to Saint Charles about 1868. He was a charter member of the Winona County Medical Society organized the next year. Later, in 1878, he became president of that society. In 1870, Dr. Guthrie was elected to membership in the State Medical Society. He was the first president of the library association organized at Saint Charles in December, 1871, and again held that office in 1879. Dr. Guthrie engaged in the drug business with Tamblin in 1869, and again with a man named Smith as a partner in 1873, and probably continued in that business until his departure in 1881. At that time he moved to California. It is interesting to note that Guthrie read a paper on "Indigenous Remedies" before the Winona County Medical Society in 1874.

B. Hahn came to Winona in November, 1869, and published the following card:

DR. B. HAHN
(Late Surgeon, U.S.A.)
German Physician

Medical and Surgical Office, Third Street opposite
N. H. Wood's Store.
Residence—Sixth Street, between Lafayette and
Walnut.

T. E. Hall was a doctor in Dresbach in 1883.

E. W. Hammes graduated from Rush Medical College in 1882. He lived at New Trier until he moved to Winona in 1884 or 1885. Dr. Hammes became a member of the Minnesota State Medical Society in 1883. He remained in Winona for several years and then moved to Hampton.

E. A. Hebard, M.D., came to Winona in April, 1862, and associated himself with Dr. A. S. Ferris. He later succeeded to Dr. Ferris's practice. In 1879 he moved to Grand Rapids, Michigan.

N. F. Hilbert was a doctor at Rollingstone in 1882.

A. T. E. Hilton resided in Winona for a year or two about 1865-1866. He died at East Orange, N. J., in January, 1884, at the age of seventy.

Jens Hohn was a Winona doctor in 1863.

Holeman S. Humphrey came to Winona in 1866. His first advertisement read:

"A cure guaranteed in every case of piles treated and no money required until the cure is effected." In May, 1876, he opened a surgical institute in a building on which he had a five-year lease. He had several assistants and treated all manner of surgical cases and constitutional diseases. In 1878, he started the New Turkish Bath and Surgical Institute, with a ten-year lease on his new building. His business met with unusual success in Winona. He sold his establishment in August, 1880, and moved to Janesville, Wisconsin.

Dr. Ireland practiced medicine at Beaver in 1857. He may also have lived at Elba.

I. P. Jones practiced at Dresbach at some time between 1883 and 1890. He had an exemption certificate.

W. C. Jones was one of the early settlers of Winona and proprietor of the Minnesota House (at Winona) in 1854. He did not practice medicine there. In 1881 he was living near Rock Island, Illinois.

C. R. J. Kellam came to Saint Charles with his family and started practice in the spring of 1876. He came from Lynn, Massachusetts, and was a graduate of Harvard Medical School. He published a half column in the *Saint Charles Union* the following spring, a treatise against the practice of advertising by medical men. During most of his stay in Saint Charles, Dr. Kellam kept an accurate thermometrical record of the weather. He died in that village in March, 1879.

Linn A. Kelly, M.D., was born in Schenectady, New York, May 18, 1845, and was brought to Elgin, Illinois, when a small boy. He attended the grade schools there, then studied at Galesburg, Illinois, and at Beloit College, Beloit, Wisconsin. He entered the Eclectic Medical Institution at Cincinnati and finished his medical education at the Bennett Medical College of Chicago, graduating from that institution in 1869. He at once started prac-

tice at Peoria, Illinois. After a short time, he went to Elgin and practiced there until he came to Winona in 1872. His physician's card read as follows:

DR. L. A. KELLY
Physician and Surgeon
County or City calls attended day
or night promptly

Dr. Kelly was city physician of Winona for two years in 1881-1882. He was president of the Winona Board of Education for one year, and a member for several years. He was also a member of the Eclectic Association of Minnesota, and was on the State Board of Pension Examiners. He died in Winona in 1910.

Edward D. Keyes was born and raised in Winona. He received his early education there, and at the age of twenty-two became the student and office boy of Dr. Franklin Staples. In the fall of 1883 he entered Rush Medical College. He graduated from that institution in February, 1885, and on March 1 of that year, started practice in Winona with Dr. Staples. Later, he became one of the prominent physicians of that locality. In the year he started practicing, Dr. Keyes was elected to membership in the Winona County Medical Society and in the State Medical Society. His son, John Dwight Keyes, was later associated with him.

Dennis Kimberly, M.D., practiced in Winona in 1863.

R. C. Kirk was a Winona doctor. He left that town in July, 1858.

D. A. Knapp arrived in Saint Charles from Maine in 1883 and succeeded to the practice of Dr. W. A. Chamberlain. Soon after that, he moved to New Richmond, Wisconsin. Dr. Knapp may have practiced in Winona County at an earlier date, about 1864.

N. S. Lane came to Winona about 1877 and was still practicing his profession there in 1931.

Oswald Leicht graduated from the Medical School of Northwestern University in 1898 and came to Winona to practice the same year.

Ferdinand Lessing graduated from the University of Pennsylvania in 1868. In 1871, while practicing in Wabasha, he became a member of the State Medical Society. He came to Winona City about 1875, and in that year he was elected to membership in the Winona County Medical Society. He was one of the instructors in the Winona Preparatory Medical School about the same time. Dr. Lessing was an active Democrat, and was elected County Coroner in 1876, holding the office for several years thereafter.

Hans Moritz Lichenstein was born in Germany in 1866. He graduated from the University of Tübingen in 1890 and came to Winona the following year.

Dr. Lozier was a Winona doctor about 1867.

H. Mager, M.D., opened an office in Winona in July, 1881. He was "formerly from Milwaukee, but latterly from Europe." Two months after his arrival, he moved to Le Sueur, Minnesota.

J. B. Maitland may have practiced in Winona County in 1857.

Jacob Marti was a Winona physician in 1866. He still practiced there in 1885.

R. C. Mason came to reside in Winona permanently in December, 1885.

M. M. Mead came to Winona about 1858 and practiced there until he received the appointment of Assistant Surgeon to the First Minnesota Heavy Artillery in January, 1865. He returned from service in poor health nine months later, and again took up his practice. In August, 1871, he left Winona to engage in practice elsewhere.

Dr. McCartney practiced in Winona County in 1879.

Thomas McDavitt, M.D., graduated from the Chicago Medical College in 1879. He came to Winona to practice about 1881, having practiced medicine at Minneiska for eighteen months. Originally he was from Quincy, Illinois. In May, 1881, he and Dr. J. B. McGaughey experimented on a device to rid the county of wolves by means of chloroform. Apparently the device was not a success. During the year 1882 he was elected to membership in the State Medical Society and in the Winona County Medical Society. He became president of the latter society in 1883. In 1883, he and Dr. McGaughey had offices together as partners. At a later date he moved to Saint Paul. At the time of his death, he was a trustee of the American Medical Association.

Hugh F. McGaughey was the son of Dr. J. B. McGaughey and was born in Winona in 1873. He was educated at the University of Michigan and received his medical degree from The College of Physicians and Surgeons of New York in 1896. He began his medical career in Winona in that year. He was a man of unusual ability and successfully carried on the traditions of his father. He died suddenly in Tacoma, Washington, on July 20, 1919.

James Brown McGaughey, M.D., was born near Gettysburg, Pennsylvania, December 1, 1842. In 1849, his father who was a railroad contractor and builder brought the family by wagon train to McDonough County, Illinois, and settled on a farm. It was there that James McGaughey received his early education in private and public schools and in the McDonough Presbyterian College. In January, 1862, he enlisted as a private in the Tenth Missouri Infantry, U.S.V. The following year he became hospital steward of the First Alabama Cavalry, U.S.V. Later he received an appointment in the secret service and was very successful in enlisting Union men within the rebel lines. Soon after receiving the commission of second lieutenant of Company H, First Alabama Cavalry, he was captured and taken to Libby Prison. While in the hospital service and at other times during his busy army life, he found time to follow his bent for medical studies, his reading being guided by his brother-in-law, Dr. A. B. Stuart. After the war, he attended Berkshire Medical College, at Pittsfield, Massachusetts, and subsequently completed his course in the medical department of the University of Michigan. He received the degree of M.D. in March, 1867. The following month, he came to Winona and entered on forty-one years of continuous practice. Dr. McGaughey became a successful physician and surgeon, and was reputed an authoritative diagnostician. His work was characteristic-

ally progressive as he made frequent trips to the best hospital clinics and was a tireless reader of professional literature. He came to Winona to practice with Dr. A. B. Stuart. Later he had as his partners Dr. A. B. Young, Dr. Thomas McDavitt, Dr. D. B. Pritchard, and his son, Dr. Hugh F. McGaughey. He was for seven years a member of the firm of the Associated Physicians and Surgeons.

Dr. McGaughey had an amazing number of organization affiliations. He was one of the organizers of the Winona County Medical Society, and its secretary from 1873 to 1908. He was also one of the founders of the Southern Minnesota Medical Association, and was its president in 1894. In 1869, he was elected to membership in the State Medical Association, and held the office of president in 1884-1885. He held a membership for many years in the Minnesota Academy of Medicine. He joined the American Medical Association in 1872, and was several times a delegate to the national conventions.

Dr. McGaughey took an active part in educational matters. For ten years he was a member of the Board of Education, its president twice—in 1878 and again later. For several years he was an instructor in the Winona Preparatory Medical School.

Among his public offices, Dr. McGaughey held that of County Coroner in 1872 and 1873. In 1876-1878 he was county physician in Winona.

Numerous other organizations claimed his attention. He was one of the founders and served as president of the Winona Building and Loan Association. He had a membership in the Masonic Order, in the Board of Trade, in the Arlington Club, of which he was once president, and in John Ball Post, G.A.R., of which he once served as commander and for many years as post surgeon.

In later life Dr. McGaughey served on the State Board of Medical Examiners and on the State Board of Health. He was a delegate selected by the governor to the International Congress of Tuberculosis which met in Washington, D. C. He was one of the original members of the Board of United States Examining Surgeons for Pensions in Winona and was secretary continuously from its organization until his death.

Among his reports and papers are: "The Purity and Proper Preparation of Medicine" given before the Winona County Medical Society in 1871, and a paper on "Cholera Infantum" given before the same society in 1874. In 1878 he made a report to the State Medical Society on venereal diseases, and the following year he gave the report of the Committee on the Nervous System. In 1882 before the same society, he gave the report of the Committee on Surgery. In 1885 several essays by him entitled "Fracture of the Internal Condyle of the Humerus," "Femoral Hernia—Sloughing—Death," and "Compound Fracture of the Fore-arm" were published with the Report of the Committee on Surgery. Dr. McGaughey died in Winona in 1908.

(To be continued in August issue)

President's Letter

It is repeatedly emphasized by authorities that many more cancers could be cured than are now cured if patients could be treated early.

This truth is accepted by most of us as self-evident and we have all been irked by the seeming slowness of our educational efforts directed toward bringing the cancer patient in for examination in the curable stage.

For that reason most physicians welcome the aid in this work of education offered by the Women's Field Army Against Cancer.

Every effort has been made by this organization of women to keep its educational matter and its methods under qualified medical direction. Physicians serve on its executive committee and as speakers, advisors and aids.

Competent women head the Minnesota organization, women who have the entrée to all major women's organizations and movements, and who have given satisfactory evidence, over several years of campaigning in Minnesota, of their genuine wish to work closely with physicians and to disseminate only authoritative information under ethical auspices.

That the majority of the members of the Minnesota State Medical Association are wholeheartedly in accord with the work of the organization is amply evident in the results of a questionnaire sent to all members with the last NEWS LETTER from the state office. More than 95 per cent of the approximately 300 replies already received from all parts of the state approve the Field Army and its objective. Many greet it with enthusiasm. Others regret that the effects of its work have not yet reached out to a large number of rural districts of the state. They approve the principle, however, and declare their belief in public education as a powerful weapon in the fight against cancer.

The handful who disagree, object to any campaign of cancer education on the ground that it is likely to create cancer phobia and that this danger outweighs the good that may be done.

In view of the testimony of the overwhelming majority, however, it may be taken for granted that Minnesota physicians in general are heart and soul behind this effort of the women to bridge by education the gap between the early symptoms and their discovery and treatment. The Council has repeatedly endorsed the work of the Field Army and it should be a part of the professional duty of every member to coöperate in this work.

B. S. ADAMS, M.D., President,
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

Volume 23 JULY, 1940 Number 7

THE 1940 A. M. A. SESSION

THE meeting of the American Medical Association in New York City last month was a success from every angle. It was the largest in history, 12,864 physicians having registered. Those who attended were impressed by the quality and number of the scientific exhibits which have come to rank with graduate training.

The House of Delegates with its representatives from state associations, army and navy, the public health service, outlying possessions and scientific sections, is the governing body of one of the few democratic organizations left in the world. That the importance of being a delegate is realized is attested by 171 of the 175 membership having attended.

The keynote of the meeting of the House of Delegates was the importance of preparedness of the medical profession in case of war. Its action in appointing a committee of ten of its members and five association officials to take steps to canvass state and county organizations to obtain the names of those willing to serve, is characteristic of American physicians in placing national issues first.

The Delegates chose Dr. Chevalier Jackson of Philadelphia the recipient of the annual distinguished service award. Of interest to Minnesota physicians was the high tribute paid the late Dr. Charles B. Wright of Minneapolis by the chairman of the Board of Trustees. Also of special interest was the election of Dr. William Braasch of Rochester as a member of the Board of Trustees to take Dr. Wright's place.

The question again arose as to the best way for the profession to take care of its needy members and it was the general sentiment that each state should care for its own needy members.

The rather fantastic resolution that the entire population be submitted to blood typing and Wassermann testing was voted down. The bill reported to have been introduced in the United States Senate to have a National Doctors' Day was not endorsed. Really, has the senate nothing more important to do?

Medical economics came in for its share of discussion. It was recommended to leave the question of fees to local county societies; that group hospitalization plans be kept separate from medical pre-payment plans; also that any of the latter plans be submitted to the American Medical Association Bureau of Medical Economics for approval.

Anesthesia has come into its own. This struggling specialty was dignified by the Delegates by the creation of a scientific section of its own.

As the officers of the American Medical Association serve from annual meeting to annual meeting, Dr. Rock Sleyster retires. Dr. Nathan B. Van Etten became president and Dr. Frank

H. Lahey is the president-elect. Next year the convention will be held in Cleveland; in 1942 in Atlantic City; and in 1943 in San Francisco.

MEDICAL PREPAREDNESS

THE inaction following the destruction of Poland made it appear that World War II was resolving into an economic struggle. The fast and furious events of the recent two months, however, have made the world realize that a megalomaniac dictator has obtained domination over Europe, aided and abetted by an equally unprincipled dictator who has brought upon himself contempt of the world.

Of a sudden we Americans have come to realize that we are not sufficiently armed to maintain the Monroe Doctrine, and perhaps not even to defend our own shores—without the help of the English navy.

This sudden realization of our unpreparedness has swept like a wave over the country. Preparedness for modern warfare is more involved than it used to be and requires more time not only for the training of personnel, but in the production of machine equipment.

In case of war there will be the same need for the services of the medical profession. That the profession does not propose to be caught napping is evidenced by the steps taken last month at the American Medical Association meeting in New York City. A resolution was submitted to the House of Delegates by the Board of Trustees through its chairman for the establishment of a Committee on Medical Preparedness to carry out certain preliminary steps in the naming and classification of physicians available for military duties, and to cooperate with the War Department. Such a committee, consisting of ten members of the House of Delegates and five officers of the American Medical Association has already been appointed by the Speaker of the House and will work through state and county medical organization. A section in the *Journal of the American Medical Association* has already been established for publicizing the activities of the committee.

In case of war civilian population as well as the army will need medical services and the designation as to where a physician will be most useful can be better made with deliberate plan-

ning than in a hurry following the declaration of war.

In our last war the services of some 60,000 physicians were made available for military and related activities. Many entered the service who should have stayed at home, and vice versa. Such mistakes can be prevented by preliminary planning. That there will be fully as great a patriotic response in case of need in the near future as there was twenty-three years ago goes without saying. Patriotism can, however, be displayed by coöperation in this preparedness campaign as well as in actual war.

A DIABETIC MANUAL

IN SPITE of advances in our knowledge of the dietary treatment of diabetes and in spite of the discovery of insulin the incidence and mortality of the disease have been on the increase the past two decades. On the other hand properly treated diabetics live much longer than they used to. The conclusion seems deductible that diabetics are not receiving proper care. This may be the fault of the diabetic patients themselves, the medical profession, or both.

Constant dieting is a chore and it is not surprising perhaps that many diabetic patients weary of dieting and reporting regularly to their physicians.

The profession, too, is doubtless to blame to some extent in not having impressed on his diabetic patients the importance of control of symptoms. Dietary instructions have been at times so complicated that patients have thrown up their hands in disgust. Or diets have been so far removed from normal in carbohydrate and fat content that they have proven disagreeable to the patient.

Further, there is no disease the treatment of which has undergone more changes during the past two decades than has that of diabetes. This has made it difficult for the internist to say nothing of the general practitioner to keep abreast of developments without special effort.

Realizing the growing importance of diabetes as a cause of morbidity and mortality a Committee on Diabetes of the Minnesota State Medical Association was appointed several years ago. To help the physician take better care of his diabetic patients this Committee has issued

(Continued on Page 494)

In Memoriam

Arthur West Allen

Dr. Arthur W. Allen, Austin, Minnesota, died on May 6, 1940.

Dr. Allen was born in Austin in August, 1862, the son of Dr. Orlenger Allen, who was the first doctor in Austin, having located there in 1856.

Dr. Allen obtained his medical degree from Rush Medical College in 1885 and returned to Austin to practice. On September 14, 1905, he was married to Miss Nellie Sutherland of Austin, who survives him.

Although Dr. Allen never sought nor held political office, he was always interested in civic enterprises and was active in politics in former years as a Republican. Before the Panama Canal was built he accompanied a congressional committee on a visit there as a guest.

Dr. Allen was a member of the Mower County Medical Society, the Minnesota State and American Medical Associations and for years a surgeon for the Chicago, Milwaukee and Saint Paul Railway. He was a member of the American Railway Surgeons, a Mason and an Elk. In fact he was one of the few surviving charter members of the Austin Lodge of Elks. For a number of years he was a surgeon in the National Guard.

Olav Nelson Birkland

Dr. Olav Nelson Birkland was born in Bergen, Norway, August 17, 1887. As a boy he continued his education in Edinburgh, Scotland, and afterward came to America. He attended the Red Wing Seminary. After attending the Universities of Minnesota and Wisconsin he obtained his Bachelor of Arts degree May 29, 1913. He graduated from the Medical School of Northwestern University in June, 1917, and spent one year studying at the Chicago Lying-in Hospital in Chicago.

Dr. Birkland was a member of the Phi Beta Pi fraternity, the St. Louis County Medical Society, and was a member of the Rood Hospital staff of Hibbing, Minnesota for twenty-one years. He died on February 2, 1940, of coronary disease.

Arthur Stephen Hamilton

Dr. Arthur Stephen Hamilton was born on November 28, 1872, in Wyoming, Iowa, and died on June 2, 1940, at his home in Minneapolis. On January 13, 1935, he was stricken with a cerebral hemorrhage and was confined to his home up to the time of death.

He obtained his B.S. degree from the University of Iowa in 1893, and his M.D. degree from the University of Pennsylvania in 1897. He interned at the Post-Graduate Hospital in Philadelphia and then became Assistant Physician at the Independence State Hospital, Independence, Iowa, which position he held until 1904 when he came to Minneapolis.

He founded the Department of Neuropathology at the University of Minnesota, and subsequently was made Professor of Nervous and Mental Diseases and Chief of the Division, at the Medical School, and served in that capacity until the onset of his illness in 1935.

Dr. Hamilton was one of the founders of the Minnesota Society of Neurology and Psychiatry; a member and past president of the Minnesota Academy of Medicine; a member of the Minnesota State Medical Association; and a member and past president of the Hennepin County Medical Society.

He was a member of the American Medical Association and an ex-chairman of the Section of Nervous and Mental Diseases. He was one of the founders and a past president of the Central Neuropsychiatric Association. He held membership in the American Neurological Society, the American Psychiatric Association, and the Chicago Neurological Society.

During the World War Dr. Hamilton was a major in the medical corps from May of 1918 until August of 1919. He was a member of Phi Delta Theta academic fraternity and of Nu Sigma Nu medical fraternity.

Dr. Hamilton was an outstanding leader and teacher in the field of nervous and mental diseases and was widely known by the profession because of his activities in this field. He was a man with a very affable disposition, and always showed a tenderness in his heart toward everyone. He exhibited an untiring patience in everything that he attempted. At the time he was stricken, he was working very diligently, preparing a History of Medicine in Minnesota.

Dr. Hamilton is survived by his wife, Susanna P. Hamilton, and one son, David A. Hamilton.

John Snell Holbrook

John Snell Holbrook has gone to his final reward. He leaves a memory of honesty, dignity, faithfulness, in their truest meaning—as a man, physician, and friend—to all who knew him.

Born at Arkansaw, Wisconsin, December 17, 1873, he learned in childhood to watch his father, who was a lumberman, at work—and later that became his hobby. He would try out methods of bone union at his lathe, when he wasn't shaping toys and tables and "what-nots" for his children and friends.

Dr. Holbrook attended high school in Northfield, Minnesota, and studied at Carleton College. At Northfield he also met and married his wife, Mary Amaline Whiting, beginning the family life, to which he constantly devoted himself with loving, tender sacrifice. Graduating from the University of Minnesota Medical School in 1896, he served his internship at St. Mary's Hospital in Minneapolis. In 1897 he be-

came associated for several years with Dr. J. W. Andrews, at Mankato, and practiced in Mankato until his death on June 8, 1940.

He was married in 1900. His widow and two of their three daughters survive him. Mrs. Charles Rickert, who was Louise Holbrook, died a few years ago. Surviving are Mrs. Loren Hurd of Philadelphia (Eleanor) and Mrs. Reid Mohn of Red Wing (Mary), and several grandchildren.

Dr. Holbrook was justly proud of the records made in the regular U. S. Army by two of his brothers. One, Major General Willard A. Holbrook, was Chief of Staff of Cavalry, U. S. A. Major General LeRoy Holbrook is now retired, resident in Idaho. Another brother, B. F. Holbrook, lives in Minneapolis.

The First Baptist Church of Mankato claimed Dr. Holbrook's loyal membership for many years. He was also a Kiwanian and a York Rite Mason and Knight Templar.

In January, 1916, he, with Dr. A. E. Sohmer and Dr. Lida Osborn, formed the first Clinic in Mankato, which is now in its twenty-fifth year. He dearly loved the work of the Clinic, because of the opportunities that it offered for mutual consultations and discussions with his colleagues, and for the friendships of a real medical family.

A student in his profession, he kept in contact with other Clinics and attended medical meetings faithfully. In the past twenty-five years his work was limited to surgery, and especially, orthopedics. He became a Fellow of the American College of Surgeons, and was a former president of the Southern Minnesota Medical Association. In organized medicine he began as a member of The Blue Earth County Society, of which was a president, and then held Minnesota State Medical Society and A. M. A. membership. He finally became a Councillor of the Fourth District for several terms, fulfilling this exacting task with full application to the interests of his fellow doctors in medicine. At home, besides his work at the Clinic, he was surgeon on the staffs of St. Joseph's and Immanuel Hospitals, and surgeon to Omaha, Northwestern, and Great Western Railway Companies. At one time he was a member of the Mankato School Board. At the present time he was on the City Park Planning Board; a respected and useful citizen of his home community.

A full and useful life ended suddenly on June 8, 1940, at the age of 66 years; a life just short enough of perfection to make him human.

As a family man, church member, civic organizer, fellow practitioner, and friend, he will be missed, though his memory will remain as a challenge to us who remain; an example of a good man, a good doctor, and a good friend. His work was well done—it will linger on—it is a blessing to us to have known and worked with him.

The deep sympathy of his medical colleagues throughout the State, with the grateful memory that his sojourn in this life has made the world a better place because of his presence in it, is tendered herewith to his family and friends.

Clarence Prentice Rice

Dr. Clarence P. Rice of Breckenridge, Minnesota, died at Saint Francis Hospital, April 12, 1940, after having been in poor health for some time.

Dr. Rice was born in Armada, Michigan, in 1875. During his childhood his parents moved to Toledo, Western New York, Northern Illinois and to the vicinity of May City, Michigan. At the age of fourteen he came to Minnesota and made his home with an uncle on a farm in Big Stone county. He attended school at Ortonville and graduated from high school in 1895. He began his academic course at the University of Minnesota. At the outbreak of the Spanish-American war in 1898 he joined Company "E" of the 13th Minnesota. At the taking of Manila he was wounded and spent some time in the hospital. In January 1899, he was honorably discharged from service.

After teaching school in Big Stone county, Dr. Rice returned to the University of Minnesota in 1901 to study medicine. In June, 1903 he went to Mexico where he practiced his profession and acted as paymaster on a sugar plantation near Vera Cruz for a year. He then returned to the University and received his medical degree in 1906. The next two years he spent in hospital and general practice in Minneapolis, and in August 1908 opened an office in Breckenridge. After practicing many years in Breckenridge he moved his office to Wahpeton, North Dakota. He was a member of the North Dakota Medical Association.

Dr. Rice married on August 9, 1910, Agnes Hughes, who with a daughter, Margaret, of Warren, Minnesota survive. A son, Prentice Hugh Rice, died in 1936 at the age of twenty-five.

Kee Wakefield

Dr. Kee Wakefield, who until a month before his death lived with his son, Harry, in Minneapolis, died at Ellendale, North Dakota, May 8, 1940.

Dr. Wakefield was born in Green township, Trumbull County, Ohio, December 28, 1842. At the age of fourteen he came with his parents to a farm near Excelsior, Minnesota. In August, 1862, he enlisted with Company B, Ninth Minnesota Volunteer Infantry and served three years in the Civil War.

After the war he studied six months under Dr. A. E. Ames in Minneapolis and in 1867 went to Ashtabula, Ohio, where he studied in what is now the medical department of Western Reserve University. Here he received his M.D. degree in 1869.

Returning to Minnesota, Dr. Wakefield took up his profession in Hutchinson where he practiced for forty-five years.

Dr. Wakefield was married March 7, 1871, to Lucy Day at Excelsior. His wife died in 1899. One daughter, Amy, died in 1919. A son, Harry, of Ellendale, North Dakota, survives.

Dr. Wakefield and his brother, Thomas, a Hutchinson resident, were the only two remaining members of the G.A.R. in McLeod county. Dr. Wakefield practiced in Hutchinson from 1870 until his retirement in 1915. He took an active part in community affairs.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

PHYSICIANS AND NATIONAL DEFENSE

Two months ago it might have been predicted with certainty that the House of Delegates of the American Medical Association in session in New York would concern itself principally with new government health programs and the protection of the essentially American form of medical practice.

But two months ago Germany had not begun its victorious march in Europe and few people in America had awakened to the great issue of our own national defense.

It was typical that the fight to preserve their professional freedom—so precious to physicians—should take second place in the attention of the delegates and that the part the medical profession will play in national defense should come first.

Dr. Nathan B. Van Etten, taking office as president of the American Medical Association, warned that "the United States has arrived at a time when it must fight for the sanctity of its national life" and offered all of the resources of the organization of American physicians to the government for national defense.

Army Plan

Action on the matter was immediate. Lieutenant-Colonel G. C. Dunham of the Army Medical Corps presented the Army's plan for securing professional personnel.

This plan called for the American Medical Association, through its state and county societies:—

1. To make a complete canvass of the profession and list every doctor who is willing and qualified for military service:—
2. To keep a roster of these men according to locality and qualifications:—
3. To provide the Army Medical Department

and the War Department with names from this list as they may be required.

"This plan," Col. Dunham declared, "would distribute the professional load and, if properly administered should prevent the stripping of rural and isolated communities of their necessary medical personnel."

"Punch-Card Basis"

Dr. Morris Fishbein of the American Medical Association pointed out in press quotations that the plan would put United States physicians on a punch-card basis and that no direct enlistment of physicians on their own would be required.

A resolution was passed by the delegates calling for appointment of a medical defense committee which should work with the government to put the plan into immediate action.

The resolution granted freely that military need called for relinquishment of individual freedom in the interest of national unity but declared also that freedom must be returned after the national emergency has passed.

Committee Appointed

The committee asked for by the delegates was immediately appointed with Dr. Irvin Abel of Louisville, Kentucky, former president of the association, as chairman. Other members were Dr. Stanley H. Osborn of Hartford, Conn.; Walter G. Phippen, Boston; Harvey B. Stone, Baltimore; James E. Paulin, Atlanta; Fred W. Ranken, Lexington, Ky.; Roy W. Fouts, Omaha; Sam E. Thompson, Kerrville, Texas; Charles A. Dukes, Oakland, California, and John H. O'Shea, Seattle. Ex-officio members are Dr. Van Etten; Dr. Olin West, secretary; Dr. Arthur W. Booth, Elmira, N. Y., chairman of the Board of Trustees; Dr. Austin A. Hayden, Chicago, secretary of the trustees, and Dr. Fishbein of the American Medical Association.

Indications are that the committee, which met before the delegates adjourned, would set plan for preparedness among physicians in immediate motion.

Permanent Step Ahead

Threats of government interference in civilian practice abounded in the first Wagner Health Bill and they are not absent from the hospital bill which has already passed the Senate. They were also discussed by the delegates and vigorously opposed. Such domestic issues, important as they are to physicians and to the ultimate welfare of America, were only temporarily subordinated to the overwhelming issue of national defense.

It is interesting to note that President Van Etten seized the occasion to point out again the advantage to the national defense of a national health department headed by secretary of health in the president's cabinet which should coordinate all government health activities.

Such a move would be logical and desirable from every standpoint in the present altered state affairs. It would also mean a permanent step ahead in the government health service to the American people.

For Coördination of Insurance Plans

The problems already encountered in many quarters where medically sponsored experiments in sickness insurance are underway likewise came in for discussion by the delegates. One of the chief of these lies in the great variations between different locally sponsored plans. The variations lie in the services covered, in the premiums paid and in methods of collection and administration. Similar variations appear between hospital insurance plans in different states. A resolution calling for coördination of all these plans passed the house together with recommendations for similar coördination of hospital insurance plans. It was the opinion of the delegates, however, that medical and hospital service plans should be kept separate in every case.

Heroin Resolution Rejected

That other interests of the physicians were not entirely submerged in talk of national defense was shown in the resoluteness with which the delegates rejected a plea to endorse the repeal

of restrictions placed by the narcotics law on heroin. Louisiana delegates declared that heroin was needed for medical purposes and that the ban against its importation should be lifted but the resolution embodying the Louisiana delegates' declaration was voted down. The American Medical Association has long held that heroin is not indispensable as a medicine.

It was pointed out in this connection by Dr. Fishbein, that enough narcotics are now on hand in the United States to meet medical needs for three years.

HOSPITAL UNITS REVIVED

Plans are already going forward for reorganizations of the base hospital units which served in the last war. "Base Hospital 26" of the University of Minnesota, is being reorganized by Dean Harold S. Diehl but it will be known as "United States General Hospital 26" this time.

It is understood that there is no lack of volunteers for this service.

In New York, in fact, three times as many physicians were said to have volunteered for duty in Army hospitals as there are commissions to be filled. A call for thirty-two medical officers in a New York hospital unit was promptly answered by one hundred volunteers.

The complete hospital plan covering hospitals of the entire nation is said to provide for thirteen surgical hospitals and seventeen evacuation hospitals and thirty-two general hospitals.

FORD ENLISTS

It has been generally agreed that the initial success of Michigan Medical Service—sickness insurance plan set in motion by the Michigan State Medical Society—would depend upon response of Michigan's big industries.

Announcement at the New York meeting of the American Medical Association that the Henry Ford factories had accepted the service for its employees is important, therefore, and promises well for the financial success of the experiment.

A complete outline of the plan is now on file at the State Office. Copies can undoubtedly be secured from the Michigan State Medical Society of which L. Fernald Foster, 311 Center Avenue, Bay City, Michigan, is executive secretary.

"SURGICAL COMPLICATIONS"

(Monthly Editorial Prepared by the Medical
Advisory Committee)

The complications of medical practice in this day and age are so varied that one cannot be blamed if at times he finds himself perplexed. By the very nature of the human mind, it is impossible for him to know all and at all times foresee all complications which may arise following heroic treatment in his endeavor to save a life.

But one can by tact and courtesy forestall many serious misunderstandings with patients which lead to a court procedure.

Heavy doses of deep x-ray and radium have their effect on the human economy but are justified in the treatment of malignant disease. Patients should be told of complications which may result.

That there are complications which follow radical mastoidectomies—nerve injury for instance—is well known and not an unforeseeable catastrophe. The patient can be told in advance of the possibility.

That spurs do form on amputated long bones after surgery is not unusual. The surgeon does not always know why but at least he can provide against legal complications by word of mouth.

Keloid formation in scars is not unusual in certain types of individuals though unsightly many times; but the surgeon who opened the abdomen or sutured the accident wound cannot be blamed for the idiosyncracies of nature in the individual so disfigured.

The lack of callus formation in fractures and delayed union is not unusual. Surgical procedures used in the reduction of the fracture cannot be blamed for nature's lack of endeavor and the patient should be armed against adverse advice by giving him a full understanding of the problem at hand.

Your Medical Advisory Committee believes that when complications do arise, insistence on consultation and a full and frank discussion of these complications and their treatment will be evidence of a conscientious endeavor to meet the emergency and an honesty of purpose for which no one can be censured.

—B. J. B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Dubois, M.D., Secretary

Saint Paul Woman Sentenced to 8-year Term For Criminal Abortion

Re: State of Minnesota vs. Della Mostert.

On May 23, 1940, Mrs. Della Mostert, sixty years of age, was sentenced by the Honorable Kenneth G. Brill, Judge of the District Court, to a term of 2 to 8 years at hard labor in the Women's Reformatory at Shakopee, Minnesota, following her plea of guilty to an information charging her with the crime of abortion. The statutory penalty for criminal abortion is not to exceed 4 years, but the sentence in Mrs. Mostert's case was doubled because of a previous conviction, in 1936, for a similar offense.

In the present case Mrs. Mostert, who resided at 1785 E. Maryland St., Saint Paul, was arrested on May 14, 1940, by the St. Paul Police following the admission of a 14 year old Negro girl to Ancker Hospital suffering from the after effects of a criminal abortion. The investigation disclosed that Mrs. Mostert performed this abortion at the girl's home on May 8, 1940, for which Mrs. Mostert admitted she received \$20.00. Mrs. Mostert had used a catheter in performing this abortion. A complaint was filed against Mrs. Mostert on May 16, 1940, and she was arraigned in the Municipal Court of Saint Paul on May 17, 1940, at which time she waived a preliminary hearing and was held to the District Court. On being arraigned in the District Court on May 20, 1940, the defendant entered a plea of not guilty and her case was set for trial on May 23rd. However, on that date, Mrs. Mostert withdrew her plea of not guilty and entered a plea of guilty.

Mrs. Mostert's previous conviction was in the District Court of Ramsey County on January 7, 1936, at which time she was sentenced to a term of not to exceed 4 years at the Women's Reformatory at Shakopee, following her plea of guilty to an indictment charging her with the crime of abortion. Mrs. Mostert was released from that institution on June 9, 1938, at which time she was placed on parole. Her parole expired in December, 1939. Mrs. Mostert has no license to practice any form of healing in the State of Minnesota. She also admitted that, with the exception of some work as a practical nurse, she has never received any medical education or training as a nurse.

Saint Paul Osteopath Receives Double Sentence In Abortion Case

Re: State of Minnesota vs. Samuel M. Stern

On June 3, 1940, Samuel M. Stern, a licensed osteopath, was sentenced in the District Court of Ramsey County, to a term of not less than two and not more than eight years at hard labor in the State Prison at Stillwater. Stern was sentenced by Judge Kenneth G. Brill, who, on May 13, 1940, had previously sentenced Stern to a term of not to exceed 4 years at hard labor in the State Prison following Stern's entering a plea of guilty to an information charging him with the crime of abortion.

Stern's sentence was doubled when the Court's attention was called to the fact that on January 3, 1922, Stern was convicted by a jury in Orange County, California, of the crime of embezzlement. He was received at the San Quentin, California prison on January 21, 1922, and served until January 27, 1923, at which time he was released on parole. The facts in that case indi-

cate that Stern and his brother, J. H. Stern, were convicted of converting to their own use a Premier automobile of the value of \$5,000.00, the car being in their possession as bailees. When Stern was arraigned before Judge Brill by virtue of his previous conviction, he stated to the Court that he had received a pardon from former Governor Merriam of California, the pardon being issued in September, 1938. It was contended by the defendant that this nullified his previous conviction, but Judge Brill ruled otherwise. The defendant indicated that he intends to appeal to the Supreme Court of Minnesota from the doubling of his sentence. In the meantime he will be confined in the State Prison on the original sentence imposed by Judge Brill.

Benton County Quack Jailed

Re: State of Minnesota vs. John Taylor, alias Hobo Jack, the Unlicensed Specialist



On June 12, 1940, John Taylor, fifty-four years of age, entered a plea of guilty in the District Court of Benton County, to an information charging him with practicing healing without a basic science certificate. Taylor was sentenced by the Honorable J. B. Himsl of the

District Court, to pay a fine of \$100.00 plus Court costs of \$23.15, or to serve 90 days in the County Jail of Stearns County, Benton County having no County Jail. Taylor was unable to pay the fine and the Court remanded him to the custody of the Sheriff to serve his sentence.

Taylor was arrested June 7, 1940, in Mayhew Lake Township by Sheriff Jos. A. Winkelman and Deputy Sheriff Earl Inman of Benton County, following a joint investigation made by the Minnesota State Board of Medical Examiners and Benton County authorities. A complaint was filed against Taylor by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, and Taylor was immediately arraigned before Otto C. H. Heinzel, Justice of the Peace, at Sauk Rapids. Taylor waived a preliminary hearing and was held to the September term of the Benton County District Court under \$500.00 bond, which was not furnished, Taylor being held in the Stearns County Jail. Taylor, who has no license to practice any form of healing in the State of Minnesota, or elsewhere, arrived in Benton County about May 15, 1940. Although Taylor claims to be a steel worker by trade, he was soon engaged in diagnosing the ailments of farm people and prescribing various medicines for which he would charge as high as \$20.00 for a 16 ounce bottle of medicine, and for which he always obtained the cash in advance. Taylor represented himself as Hobo Jack, the unlicensed specialist, and claimed to be able to cure arthritis, prostate trouble, hemorrhoids, stomach ulcers and many other ailments. He would purchase such items as fluff tannic acid, spirits of niter, powdered nutgalls and verocolate tablets at drug stores in Foley, Sauk Rapids and St. Cloud. By buying medicinal preparations that cost him not to exceed \$1.00, he would then manufacture a concoction that would be sold for approximately \$20.00 per bottle. Naturally it was just a question of time when such an imposition upon the public would be reported to the authorities. In Taylor's case it was immediately reported with his arrest following the investigation.

Taylor was closely questioned by Judge Himsl at

the time sentence was pronounced and Taylor, who claims to have been born at Carrollton, Missouri, admitted to the Court that he was neither licensed to practice any form of healing anywhere in the United States, nor had he ever studied medicine in any schools. He stated to the Court that he had practiced medicine unlawfully in California, Oregon and Washington, but claimed that he had never been arrested previously. The present case is the first prosecution in Benton County under the Basic Science Law, which was passed in 1927. This county has been free of quacks until the arrival of Taylor. The Minnesota State Board of Medical Examiners wishes to express its appreciation for the very fine co-operation given by Mr. J. Arthur Bensen, County Attorney of Benton County, Sheriff Winkelman and Deputy Sheriff Inman.

Physicians Licensed May 10, 1940

April Examination

Bailey, Robert Burr—U. of Minn., M.B. 1940, Fairmont.

Baldigo, Edward Michael—U. of Minn., M.B., 1939, Saint Paul.

Beard, Crowell—U. of Cal., M.D. 1939, Rochester.

Benson, Raymond Emanuel—U. of Ill., M.D. 1939, Rochester.

Christensen, Burt H.—Johns Hopkins, M.D. 1938, Rochester.

Currens, James Hawley—Duke U., M.D. 1938, Rochester.

Dippel, Adelbert Louis—U. of Texas, M.D. 1928, Minneapolis.

Downing, Arthur Herrmann—U. of Chicago, M.D. 1939, Saint Paul.

Emmens, Thomas Holmes—U. of Ore., M.D. 1939, Saint Paul.

Ersfeld, Murray Peter—U. of Minn., M.B. 1939, M.D. 1940, Eloise, Mich.

Frane, Donald Bernard—U. of Minn., M.B. 1937, M.D. 1938, Manhattan, Kans.

French, Lyle Albert—U. of Minn., M.B. 1939, Minneapolis.

Grove, Raymond Fisk—Northwestern, M.B. 1938, M.D. 1939, Saint Paul.

Haigler, Samuel Hartley—Tulane U., M.D. 1937, Rochester.

Klinkenberg, Royle B.—U. of Kansas, M.D. 1938, Rochester.

Krueger, Victor Robert—U. of Wis., M.D. 1939, Duluth.

Kuris, David B.—U. of Minn., M.B. 1939, Duluth.

Lake, Clifford Franklin—Northwestern, M.B. 1938, M.D. 1939, Rochester.

Loucks, Joseph Anthony—U. of Minn., M.B. 1939, Saint Paul.

Low, John Edward—U. of Minn., M.B. 1939, Saint Paul.

Lueck, Arthur George—Northwestern, M.B. 1937, M.D. 1938, Rochester.

McFarland, Corley B.—Northwestern, M.B. 1939, Saint Paul.

Mead, Franklin Braidwood—Northwestern, M.B. 1937, M.D. 1938, Rochester.

Miller, Joseph Matthew—Columbia U., M.D. 1935, Rochester.

Minckler, John Everett—U. of Minn., M.B. 1939, Saint Paul.

Minge, Raymond Kenneth—U. of Minn., M.B. 1938, M.D. 1939, Minneapolis.

Mitchell, Harriet Jean—Johns Hopkins, M.D. 1938, Minneapolis.

Murlin, William Raymond—U. of Rochester, M.D. 1933, Minneapolis.

Nelson, Lawrence Meier—U. of Neb., M.D. 1937, Minneapolis.

Nielsen, Alvin Martin—U. of Minn., M.B. 1939, Saint Paul.

Nietfeld, Aloys Bernard—U. of Minn., M.B. 1939, Minneapolis.

Palmerton, Ernest Sterling—U. of Minn., M.B. 1938, M.D. 1939, Kansas City, Mo.

Peterson, Donald Herbert—U. of Minn., M.B. 1939, Saint Paul.

Polmeteer, Frank Edward—U. of Iowa, M.D. 1936, Rochester.

Root, Grosvenor Thomas—U. of Mich., M.D. 1937, Rochester.

Shima, George Joseph—Creighton, M.D. 1939, Saint Paul.

Smiley, John Thomas—Northwestern, M.B. 1939, Saint Paul.

Standard, William Perry—Northwestern, M.B. 1937, M.D. 1938, Rochester.

Stover, Lee—Rush Med. Col., M.D. 1938, Rochester.

Thompson, Carl Oliver—U. of Minn., M.B. 1938, M.D. 1939, Minneapolis.

Tostenson, Norman E.—U. of Minn., M.B. 1940, Minneapolis.

Warne, Merna Mary—U. of Wis., M.D. 1938, Minneapolis.

Wilson, James Webster—McGill U., M.D. 1937, Rochester.

Wyrens, Rollin Gerald—Northwestern, M.B. 1937, M.D. 1938, Rochester.

By Reciprocity

Dricken, Hilbert Nickolas—Marquette, M.D. 1935, Milwaukee, Wis.

Goldner, Meyer Zachary—U. of Neb., M.D. 1935, Minneapolis.

Milhaupt, Emmett Norbert—U. of Wis., M.D. 1935, Minneapolis.

Stevenson, Walter Davis, Jr.—Wash. U., M.D. 1937, Rochester.

National Board Credentials

Booth, Marguerite—Yale U., M.D. 1935, Minneapolis.

Gray, Robert F.—Northwestern, M.B. 1938, M.D. 1939, Marshall.

Minty, Earl Walter—Northwestern, M.B. 1932, M.D. 1933, Faribault.

Rogers, Arthur Merriam—Cornell U., M.D. 1937, Rochester.

EARLY DIAGNOSIS CAMPAIGN

(Continued from Page 478)

comes, the contacts of the positive reacting child and of the known case will all be examined. Then perhaps everybody, including the doctors themselves, will have a complete physical examination on every birthday

References

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- Chadwick, Henry D., and Evarts, Helen W.: Treatment of pulmonary tuberculosis in adolescence. Am. Rev. Tuberc., 41:307, (March) 1940.
- Kayne, G. Gregory: B.C.G. vaccination in western Europe. Am. Rev. Tuberc., 34:1; 10-42, (July) 1936.
- Nicholson, Edna E.: Study of tuberculosis mortality among young women. Nat'l. Tuberc. Assn. Social Research Series No. 4, p. 7. (The figures for 1935 have been added by the author—E. MARIETTE.)

From the point of view of the clinical management of the individual case of tuberculosis and from the broader aspect of public health control of the disease, no one test occupies a position of greater importance and significance than that of the sputum examination. The persistence of a positive sputum is regarded as clear evidence that pathological activity of the disease has continued. An improved technic of sputum examination for acid-fast bacilli using tergitol has been reported. The use of this is said to approximate the results obtained by the use of guinea-pig inoculation, which is impractical except in selected cases because of cost.—S. A. PETROFF and P. SCHAIN, Quar. Bull. of Sea View Hosp., (Jan.) 1940.

A DIABETIC MANUAL

(Continued from Page 487)

a booklet, a revised edition* of which has just appeared. This booklet is written for the diabetic patient and is for the use of the physician. It makes easy the selection of the best diet for the individual case and bridges over the difficulty of instructing the patient regarding his diet.

When one considers the many diabetic manuals which have been published for the use of these patients, most of them entirely too complete and of the typewritten diet lists given patients on leaving hospitals, one can feel sure that this booklet will fill a widespread want. It is a gem.

*This booklet entitled "Diabetes—How to Make It Harmless" can be purchased for ten cents a single copy, \$1.00 a dozen from State Association office, 493 Lowry Medical Arts Building, St. Paul.

OF GENERAL INTEREST

A new building which will house his offices is being constructed in Ruthton by Dr. A. F. Sether.

* * *

Dr. Charles E. Rea has opened offices at 917 Lowry Medical Arts Building, Saint Paul, for the practice of surgery.

* * *

Dr. J. J. Ederer of Mahanomen has been appointed Soo Line physician and surgeon for the Mahanomen district.

* * *

A total of 344 degrees were granted by the university medical school in June. Earlier in the school year, 181 degrees were granted, making a total of 525.

* * *

Dr. Henry John Kurtin, who has been practicing at Lonsdale for the past two years, is now located in Blooming Prairie where he opened an office in June.

* * *

Dr. F. A. Figi of Rochester was elected secretary-treasurer of the American Association of Oral and Plastic Surgeons at a recent meeting held in Kansas City and St. Louis.

* * *

Dr. C. W. Woodruff and Dr. David T. Schuele of Chatfield will open a hospital there in August. They have purchased a home on a half acre of ground, and are remodeling it.

* * *

Dr. Robert Lyman Nelson of Duluth and Miss Phyllis Shaw were married June 1. The bride is the daughter of Mr. and Mrs. Percival Morse Shaw Jr. of Duluth.

* * *

Dr. Bill Henry Williams, who has been associated with the University of Minnesota Hospitals, left Minneapolis, July 1 to enter practice with Dr. Samuel Grantham of Joplin, Missouri.

* * *

The marriage of Dr. George S. Bergh, instructor in surgery at the university medical school, to Miss Patricia Stephenson (the golf-playing Patty Stephenson) took place in Minneapolis, June 15.

* * *

Dr. Charles Sheard attended the convention of the American Optometric Association in Cincinnati, Ohio, in June, and a meeting of the council on education of the association. He is chairman of the council.

* * *

Dr. C. M. Jackson, who for 27 years has headed the department of anatomy at the University of Minnesota Medical School, has been granted a partial leave of absence next year because of his health. He has held the post of department head since 1913. Dr. E. A. Boyden has been appointed acting head of the department for next year.

Dr. G. Frank Corbett of Minneapolis, who has been clinical professor of surgery at the University of Minnesota Medical School for many years, is retiring from his university duties. He has been made clinical professor emeritus of surgery.

* * *

Dr. Richard Varco and Louise Miller were married June 4 in Pasadena, California. They will make their home in Minneapolis, where Dr. Varco is a research assistant in surgery at the University of Minnesota Medical School.

* * *

Dr. Henry E. Michelson of Minneapolis has been appointed a member of the American Board of Dermatology and Syphilology, bringing Minnesota's representation on the board to two. Dr. Paul O'Leary of Rochester is also a member.

* * *

Dr. Eugene T. Leddy of Rochester attended the recent meeting of the American Radium society, of which he is an officer, in New York City. While in the East, he also attended the twenty-fifth reunion of his class at Harvard, and the American Medical Association meeting.

* * *

Dr. Joseph D. Selmo of Minneapolis has taken over the medical practice of Dr. Milo H. Larson in Norwood and Cologne. Dr. Larson has returned to Nicollet where he will operate the Nicollet Hospital. Dr. Selmo has been associated with Fairview and St. Joseph hospitals.

* * *

An honorary degree of doctor of science was awarded Dr. Louis Blanchard Wilson of Rochester, director emeritus of the Mayo Foundation, at the 68th annual commencement exercises of the University of Minnesota, June 15. He was one of three alumni to receive honorary degrees of their alma mater.

* * *

A sabbatical furlough for the spring quarter of the 1940-41 school term was granted last month by the university board of regents to Dr. Arthur T. Henrici, professor of bacteriology, who will conduct research in marine bacteriology and be Walker Ames professor at the University of Washington.

* * *

Dr. A. H. Logan of Rochester and his associates were awarded second prize for their exhibit at the American Medical Association meeting in New York City. The award was in a group made on the basis of excellence of presentation of previously known facts.

The five-unit exhibit on the diagnosis and treatment of polyps of the colon and rectum was compiled by Drs. Logan, C. F. Dixon, J. de J. Pemberton, L. A. Buie, P. W. Brown, H. H. Bowing, J. A. Bagen, H. M. Weber, C. W. Mayo and A. H. Bagenstoss.

Dr. Ralph V. Ellis, associate professor of preventive medicine, at the University of Minnesota Medical School, was in Saskatchewan, Canada, last month to address two divisional meetings of the College of Physicians and Surgeons of Saskatchewan. He spoke at Regina on June 13 and at Saskatoon on June 14.

* * *

Representing the University of Minnesota Medical School at the University of Pennsylvania celebration of its bicentennial anniversary, September 16-20, will be Dr. Owen Harding Wangensteen and Dr. Alfred W. Adson, surgeons. A program in fine arts, humanities, medical sciences, natural sciences, religion and social sciences will be presented.

* * *

From LaFayette College in Easton, Pa., which similarly honored his father several years ago, Dr. P. S. Hench of Rochester received an honorary degree of doctor of science at commencement exercises, June 7.

While in the East, Dr. Hench attended the convention of the American Rheumatism Association, of which he is president.

* * *

A distinguished service award was presented Dr. A. H. Sanford of Rochester by Northwestern university in June. Dr. Sanford, an alumnus of the university, was attending a committee meeting of the United States Public Health Service in Washington, D. C. at the time, and Mrs. Sanford accepted the award for him.

* * *

Dr. Charles F. Stroebel, who has been practicing medicine in Northfield for the past three years, has gone to Rochester to begin a fellowship in the Mayo Foundation. Dr. A. M. Nielsen of Minneapolis has taken over Dr. Stroebel's practice. A graduate of the University of Minnesota Medical School, Dr. Nielsen served his internship at St. Joseph's hospital in St. Paul.

* * *

Dr. W. F. Braasch of Rochester has been named trustee of the American Medical Association to fill the vacancy created by the death of Dr. C. B. Wright of Minneapolis. Dr. Braasch, a former president of the Minnesota State Medical Association, is chairman of the state association committee on medical economics.

* * *

Dr. F. L. Smith of Rochester, colonel in the medical reserve of the United States Army, has returned from third army maneuvers at Fort Benning, Ga. Forty-five thousand men composing the Blue army, mobilized at Fort Benning, opposed the Red Army of approximately 30,000 men, mobilized at Fort Sam Houston in Texas, in the most extensive maneuvers ever participated in by the regular army in peace time, from May 2 to May 29.

Colonel Smith was attached to the 6th medical regiment from Camp Devan, Mass.

* * *

Dr. and Mrs. Harold S. Diehl and children are vacationing in Honolulu. The University of Minnesota

dean of medical sciences and his family left Minneapolis, June 24, driving to the West Coast via Estes Park and the Grand Canyon. They sail from San Francisco July 19 to spend two weeks on the island. Their return to Minneapolis is scheduled for the latter part of August.

* * *

Appointment of Dr. Lester Breslow to the University of Minnesota Health Service staff, effective July 1, is announced. Dr. Breslow has completed his second year internship at the United States Public Health Service Marine Hospital at Stapleton, New York. A graduate of the University of Minnesota (B. A. cum laude, 1935; M. D., 1939), Dr. Breslow will do graduate work in the department of preventive medicine and public health also.

* * *

Dr. E. W. Minty, who for the past seven years has practiced medicine in Rapid City, South Dakota, as an associate surgeon of the Midwest Clinic, has opened a general practice in Faribault, Minnesota. Dr. Minty, was graduated from the Northwestern university school of medicine in Chicago in 1933.

* * *

There are many physicians in the state who, as officers, have given much time to their county medical societies. They are in a large part responsible for the success of their associations.

Oldest of all secretaries of county medical societies in Minnesota, in point of service, is Dr. William F. Wilson of Lake City. With the exception of one year when he was president, Dr. Wilson has been secretary of the Wabasha County Medical Society since 1896.

* * *

Dr. George O. Burr, physiological chemist who has been attached to the department of botany at the University of Minnesota, has been appointed director of the division of physiological chemistry in the Medical School, succeeding Dr. J. F. McClendon who left the university a year ago to accept a research post in Philadelphia. Dr. Burr is widely known for his pioneer work on the fertility vitamin "E" and for his discovery of the indispensability of unsaturated fatty acids in the diet of growing animals.

* * *

Dr. A. J. Herbolzheimer, Minneapolis eye, ear, nose and throat specialist, has accepted an appointment as a medical administrator for the civil aeronautics authority in connection with training of civilian aviators in the national defense program. He has gone to Washington, D. C., to assume his duties.

A World War veteran and a major in the army reserve medical corps, Dr. Herbolzheimer has been a medical examiner for army aviators 15 years. He is a former member of the city welfare board.

* * *

The announcement has been made that on recommendation of the Committee of Revision of the United States Pharmacopeia and with the approval of the Board of Trustees, the enforcement of the standards

for surgical catgut, which were amended in the Second Supplement of the U. S. P. XI, which were to have become effective July 1, 1940, have been postponed to January 1, 1941. This action was taken because certain stock now on hand conforming, except as to labeling, with new requirement would be unsalable and would result in needless financial loss.

* * *

Two Minnesota men were members of the committee which revised the manual for physicians conducting periodic health examinations, recently published by the American Medical Association. They are Dr. G. B. New of Rochester and Dr. William A. O'Brien of Minneapolis.

Acknowledgment is expressed to Dr. Walter C. Alvarez, Rochester, and Dr. Harold S. Diehl, Minneapolis, and others, for their assistance in preparing sections of the manual, entitled, "Periodic Health Examination."

* * *

Dr. Mancel T. Mitchell, former medical fellow in obstetrics and gynecology at the University of Minnesota who went to Eau Claire, Wisconsin, to practice, is now in Salt Lake City, Utah, having accepted an appointment as obstetrics consultant with the Utah State Board of Health in the Division of Maternal and Child Health.

Before leaving for Salt Lake City, Dr. Mitchell and Miss Harriet Waller, a graduate of the Eitel Hospital School of Nursing, were married.

* * *

Dr. Charles F. Code, assistant professor of physiology at the University of Minnesota, is returning to Rochester to take charge of some aspects of physiological research in the Mayo Foundation. Awarded the Theobald Smith award of the American Association for the Advancement of Science in 1938 for his work on the physiology of histamine, Dr. Code has spent the past two years at the university.

Replacing him in the physiology department will be Dr. Stanton Fetcher who will hold the post of instructor. Dr. Fetcher has been an instructor in physiology at the University of Chicago.

* * *

Dr. David G. MacMillan of St. Paul has taken over the medical practice of Dr. J. H. Raymond in Triumph.

Dr. Raymond, who has practiced there for the past five years, has gone to Canby to enter private practice. He recently returned from Chicago where he did post-graduate work in intestinal surgery at the Cook county hospital.

Dr. MacMillan, a graduate of the University of Minnesota Medical School, served his internship in hospitals in St. Paul and Duluth. He practiced in Duluth prior to going to Triumph.

* * *

Honorary degrees of doctor of science were awarded to Dr. Louis Blanchard Wilson of Rochester and

to Dr. Thomas S. Roberts of Minneapolis, at the 68th annual commencement exercises of the University of Minnesota, June 15.

Dr. Wilson is director emeritus of the Mayo Foundation, and Dr. Roberts is director of the university's Museum of Natural History and well-known author of "Birds of Minnesota."

Another honorary degree of doctor of science was awarded Charles Peter Berkey, secretary of the Geological Society of America. Fred B. Snyder, president of the University board of regents, was awarded an honorary doctor of law degree.

* * *

Examinations for Navy Medical Corps

The next examination for physicians desiring to enter the Medical Corps of the U. S. Navy, will be held at various naval hospitals August 19, 1940. Great Lakes Illinois, is the nearest location for Minnesota physicians.

Applicants must be graduates of Class A medical schools, must have had internship in a civilian hospital, must be physically qualified, under thirty-two years of age, citizens of the United States, and must pass professional examinations to be commissioned as Assistant Surgeons. Pay is \$2,699 if without dependents, and \$3,158 with dependents.

Additional information may be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C. Applications must be completed and received in the Bureau prior to August 1, 1940.

* * *

Advanced Course in Sight Conservation

An advanced course in sight conservation is being offered for the first time by the University of Minnesota at its first summer school session.

Primarily for teachers, the course is being offered through the co-operation of the National Society for the Prevention of Blindness, the Minnesota Society for the Prevention of Blindness, the Minnesota Academy of Ophthalmology, and the Department of Ophthalmology and Otolaryngology and the College of Education of the University of Minnesota.

It is being given under the direction of Dr. Frank E. Burch, head of the department of ophthalmology, and Mrs. Winifred Hathaway, of New York City, associate director of the National Society for the Prevention of Blindness.

Lecturers will include Dr. T. R. Fritzsche of New Ulm; Drs. A. G. Athens, A. O. Olson and A. C. Hilding of Duluth; Drs. W. T. Wenner and J. B. Gaida of St. Cloud; Drs. H. P. Wagener, A. de H. Prangen and C. W. Rucker of Rochester.

St. Paul men, who will lecture are: Drs. T. J. Edwards, J. J. Prendergast, C. L. Larsen, R. O. Leavenworth, and E. P. Burch. Minneapolis men are: Drs. M. C. Pfunder, W. E. Camp, J. S. Macnie, E. W. Hansen, C. W. Spratt, C. E. Stanford, W. H. Fink, E. J. Borgerson, and Charles Hymes.

MEDICAL BROADCAST FOR JULY

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

July 6—Summer Skin Problems.

July 13—The Value of a Vacation.

July 20—Gastro-intestinal Diseases in Summer.

July 27—Toothache.

COURSE IN CLINICAL ALLERGY

A course in Clinical Allergy will be given for physicians at the Center for Continuation Study, July 29 to August 3. Dr. Ralph V. Ellis of the University of Minnesota Medical School and his associates will give the entire program. For further information, physicians may write to the Center for Continuation Study, University of Minnesota.

MINNESOTA RADIOLOGICAL SOCIETY

The Minnesota Radiological Society held its twelfth annual meeting in Rochester on April 23, 1940. Doctor Bernard Nichols of Cleveland delivered the Annual Carman Lecture the same day before the Minnesota State Medical Society. The title of the lecture was "Indications for the Use of Excretory Urography In Diagnosis."

At the dinner and business meeting in the evening, Dr. Nichols addressed the society on, "The Future of Radiology." The following officers were elected for the following year: Harry Weber, Rochester, president; G. T. Nordin, Minneapolis, vice president; J. P. Medelman, Saint Paul, secretary-treasurer.

THE CAROTENE AND VITAMIN A CONTENT OF MARKET MILKS

The Council on Foods in formulating policies regarding processed foods has been cognizant of the lack of sufficient data on the vitamin A content of natural foods. Milk and dairy products are known to be important sources of this factor. Data on the carotene and vitamin A content of market milks have been obtained by Professor Peterson and his collaborators at the University of Wisconsin and are made available in a report authorized for publication by the Council on Foods. The following is a summary of the data compiled by Professor Peterson and his collaborators:

The carotene and vitamin A content of milks marketed by eight large distributors in the Madison and Milwaukee areas of Wisconsin have been determined monthly during a period of eighteen months. These milks fall into four groups: (1) market (mainly Hol-

stein), (2) Guernsey, (3) vitamin D (mainly Holstein) and (4) certified. All milks showed marked seasonal changes in both carotene and vitamin A contents. The seasonal changes in carotene were greater than those for vitamin A. The milks were fairly similar in vitamin potency per gram of butter fat. Certified milks were somewhat higher than the other milks during the late winter months. Guernsey milk, because of its higher fat content, had a higher potency on the fluid basis than the others. (J.A.M.A., May 4, 1940, p. 1748.)

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*

MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

The joint annual dinner meeting of the Rice County Medical Society and the Women's Auxiliary was held at the Carleton Tea Room, Wednesday evening, May 8. Following a brief business meeting of each organization the group adjourned to the new Northfield Community Hospital which was open for their inspection. Professor E. A. Fath of Carleton College showed specimens of color photography for the group.

* * *

Mrs. J. A. Cosgriff of Olivia has been elected as director of the St. Paul Archdiocesan Council of Catholic Women at the recent annual meeting of the council held in the Hotel Radisson, Minneapolis.

* * *

At a recent meeting of the Washington County Medical Auxiliary, Mrs. Olson of Elk River was the guest speaker. The meeting held at the home of Mrs. C. H. Sherman at Bayport was attended by nine members and two visitors. Mrs. Olson's subject was "Control of Cancer."

* * *

Mrs. J. A. Cosgriff, retiring president of the Renville County Medical Auxiliary, presided at the recent meeting held at the school house in Olivia. Reports were given and new officers were elected. Mrs. R. Billings of Franklin was elected president; Mrs. C. Hartmann of Fairfax, president-elect; Mrs. R. Erickson of Hector, vice president; and Mrs. C. H. Mesker of Olivia, secretary-treasurer. Mrs. Cosgriff gave a report of the recent state convention which was held in Rochester. Miss Eleanor Dougherty as guest speaker, spoke on "International Affairs." Other members who attended were Mrs. J. Dordal of Sacred Heart and Mrs. W. J. Bushard of Bird Island.

* * *

At the annual meeting of the Washington County Medical Auxiliary Mrs. F. M. McCarten was elected president for the coming year. The meeting was held at the home of Mrs. Landeen. Mrs. Gertrude Stevens of Lake Elmo was elected vice president and Mrs. C. H. Sherman of Bayport, secretary and treasurer. Eleven members were present.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting April 10, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 10, 1940. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p.m. by the President, Dr. James Johnson.

There were 52 members and 3 guests present.

Minutes of the March meeting were read and approved.

Amendments to the constitution, as published in the April program, were voted upon and accepted by the members present.

The scientific program followed.

SOME USES OF SULFAMIDOPYRIDIN PREPARATIONS IN THE TREATMENT OF INFECTIOUS DISEASES

MOSES BARRON, M.D.

Minneapolis

Discussion

Dr. Barron gave a very favorable report on the effect of sulfamidopyridin preparations in various infections.

Dr. F. C. RODDA, Minneapolis: I would like to comment about some of our statistical conclusions. They may have to be modified as the years go by. There is a definite cyclical change in disease prevalence and virulence. About 1830, Bretonneau, in writing a text on medicine, disposed of scarlet fever in a paragraph. It was mild, unimportant, and he referred to it as scarlatina. About ten years later he revised his text and his most prominent chapter was devoted to scarlet fever. In the interval there had occurred a violent, killing epidemic of scarlet fever. In about 1918 we had an epidemic in which the patients died within 36 to 48 hours after the onset of the disease. At present scarlet fever is very mild, even hard to diagnose. It may be that sulfanilamide may not be able to cope with the severe disease as successfully as is now indicated. In furtherance of this idea, in the past years, epidemics of diphtheria in Germany have been described which have been resistant to present-day antitoxin and immunization obtained by toxin-antitoxin and toxoids. I think we have to take into consideration, in appraisal of therapeutic agents, the cyclical changes in diseases.

Dr. S. E. SWEITZER, Minneapolis: I would like to congratulate the internists on the spread of their field of internal medicine from broken bones to scarlet fever and gonorrhea. We have treated quite a lot of erysipelas with sulfanilamide and sometimes get very good results. I think perhaps in pneumonia and some of the acute infections, this is a marked advance in therapy.

Dr. A. A. ZIEROLD, Minneapolis: I hardly feel that the discussion thus far has been entirely fair to the internist. While I realize that he has increased his field tremendously, nevertheless, the results are not

invariably as questionable as has been intimated. As Dr. Rodda has stated, the systemic infections are cyclic in character and require observation over a long period of time to determine their susceptibility to control by any one form of treatment. Compound fractures, on the contrary, are local injuries which are reasonably consistent in their behavior. We feel that our treatment of compound fractures at the General Hospital has been eminently successful and we feel satisfied that the use of sulfanilamide is a distinctly valuable agent in our routine. Before the advent of this drug, the incidence of sepsis following compound fractures was 30 per cent at the Minneapolis General Hospital and I believe that this represents a common experience. As the result of the investigation and initiative of the surgical residents, sulfanilamide was implanted in all compound fractures with the result that subsequent infections dropped to less than 1 per cent. This has been confirmed by the experience of men in other clinics and I believe is definite objective evidence of the worth of this drug in this particular field.

Dr. S. E. SWEITZER: We heard about these results which were claimed in fracture cases and we thought it might be used in leg ulcers. We packed some of them in sulfanilamide and did not get anywhere with it. I wonder, if you get such good results in fracture cases, why we do not get anywhere with the leg ulcers which are treated with it—which are a definite infection. In fracture cases there isn't usually an infection present at first, but there is in leg ulcers.

Dr. ZIEROLD: I believe that I am able to answer Dr. Sweitzer's question. The basis of treatment of compound fractures is the implantation of the drug within a closed cavity, which permits slow diffusion in the immediate vicinity of the wound for a considerable period of time. Only in this way can a satisfactory concentration of sulfanilamide be maintained. Dr. Sweitzer's treatment failed because of the presence of pus and its contained peptones which inactivate sulfanilamide, and because of his inability to implant or completely enclose the drug.

Dr. F. H. K. SCHAAF, Minneapolis: I would like to ask Dr. Zierold whether or not there is a possibility that a change in surgical technic alone has something to do with the favorable results. During the recent Spanish War, one army surgeon treated all compound fractures with radical excision of the injured tissues, and immobilization of the extremities in plaster-of-Paris, with tremendously favorable results. Sulfanilamide applied locally may be of considerable value, if it will remain in a sufficiently high concentration for some time. While I agree with Dr. Barron in many respects, many of the extremely favorable results following the use of sulfanilamide smack a bit of a Wednesday night Christian Science Testimonial Meeting. I especially object to the indiscriminate use in ordinary throat infections, unless definitely proven of streptococcus-hemolyticus origin. Sulfanilamide is not effective unless used in proper dosage, and many of us have seen dangerous cases of agranulocytosis and hepatitis follow the use of ordinary therapeutic doses. Consequently, it is my feeling that we should use sulfanilamide and the related drugs only when there is a definite indication for their use. I do not agree with Dr. Barron that either sulfanilamide or sulfapyridin have given uniformly good results in staphylococcal infections. At the New Orleans meeting of the American Congress of Physicians, directly contradictory results were reported by two groups of investigators. I

think, perhaps, it will be best for us to be somewhat critical at the present moment, to prevent the unnecessary use of these extremely valuable but dangerous drugs.

DR. O. H. WANGENSTEEN, Minneapolis: I wish to speak briefly concerning the value of local implantation of sulfanilamide about the operative site in experimental gastro-intestinal surgery upon the dog. There has been a lively local interest relating to the implantation of sulfanilamide in wounds since Dr. N. K. Jensen of the Minneapolis General Hospital and his associates first pointed out the efficacy of employing sulfanilamide in this manner as a bactericidal and bacteriostatic agent.

During the current year, Dr. Richard L. Varco, one of my young associates, has made a very interesting application of the use of local implantation of sulfanilamide. Upon completion of gastro-intestinal anastomoses of varying kinds, Dr. Varco has been placing 4 to 5 grams of sulfanilamide about the suture. He has now an operative series of between forty and fifty operations, many of which involve triple anastomoses, such as the interpolation of a short segment of the terminal ileum and ascending colon between the pyloric outlet and the jejunum to imitate the function of the Dragstedt valve, with transfer of the biliary and pancreatic secretions to a lower level in the bowel (duodenal drainage according to the Mann-Williamson method), transection and end-to-end anastomosis of the esophagus, the establishment of Pavlov gastric pouches, gastric resections and similar procedures with only three deaths in the group (none with peritonitis).

This is really an unusual accomplishment for any surgeon. Markowitz, a pupil of Frank Mann, has said quite appropriately, "If an operator has mastered the technic of resection in dogs, he need not doubt his ability to make a safe anastomosis of the human intestine. When a surgeon can perform on dogs the operation of functional exclusion of the duodenum, known as 'duodenal drainage' with a mortality of only 20 per cent, we should say that he has mastered the technic of intestinal anastomosis" (Experimental Surgery. William Wood and Company, 1937, p. 73).

The difficulties in the dog are well known to all who have had extensive experience in this type of surgery. Dr. Varco and I had been able to confirm Markowitz observation, and from my own experience in the hospital, I have the impression that similar anastomoses on man may be carried out with definitely lesser risk.

Even with employment of closed or so-called "aseptic" anastomoses in the dog, leaks may occur where the gut is punctured with the needle even though fine needles and silk are used. It is very discouraging to spend three to four hours making a complicated anastomosis in the dog to find in forty-eight hours, that the anastomosis appears to leak in many places, particularly when everything seemed in order on completion of the procedure.

It is Dr. Varco's impression that the local implantation of sulfanilamide about the anastomosis exerts a bacteriostatic effect upon the bacteria which escaped through needle punctures of the gut wall. The presence of pathogenic bacteria on the peritoneal surfaces of the anastomosed segments, Dr. Varco feels, interferes with fibrin formation and stops the healing process. Local implantation of sulfanilamide holds the bacteria in check, preventing the lysis and destruction of fibrin, thus permitting the healing process to continue normally. Dr. Varco failed to observe a similar protective influence when the sulfanilamide was administered subcutaneously.

It is well known that the dog tolerates relatively larger doses of sulfanilamide than does man. Further, the dog does not acetylate a portion of sulfanilamide administered, as does man. Consequently, in the dog,

all of it is available for bactericidal and bacteriostatic purposes. We have used sulfanilamide in this manner in colon resections, implanting usually 4 grams about the anastomosis and 2 grams in the abdominal wall above the peritoneum. The blood levels of sulfanilamide in man, following such implantation come up to maximal levels in two to three hours time. If the sulfanilamide could be implanted locally in oil, permitting even slower absorption, the protection afforded might be enhanced. It does appear that local implantation of sulfanilamide in the peritoneal cavity of the dog about complicated gastro-intestinal anastomosis is a worthwhile procedure.

MODIFICATION OF VIRUSES FOR USE AS VACCINES

ROBERT G. GREEN, M.D.
University of Minnesota
Minneapolis

Abstract

Previous to the time of Jenner it was well recognized that smallpox epidemics were severe or mild. During the eighteenth century the practice of inoculating human beings from lesions of cases of the disease in mild outbreaks became common in Europe and America. This practice was brought from the Orient to Europe early in that century through its introduction into Turkey. The introduction of inoculation with cowpox by Jenner in 1798 we recognize as one of the greatest practical achievements in medicine, but the real significance of the smallpox-cowpox relationship is just now being understood. The concept of filterable viruses did not have its beginning until a hundred years after Jenner's time, since the first filtration experiment on the mosaic virus of plants was done by Beijerinck in 1894, and the first experiment with an animal virus was performed with the virus of foot-and-mouth disease by Loeffler and Frosch in 1898.

During the past decade two virus-modifications have been accomplished by animal-passage of the virus which seem to establish the significance of this process. Beginning in 1934, Theiler and Smith passed the virus of yellow fever serially through chick embryos from which the central nervous system had been removed, and reduced thereby the pathogenic properties of this virus for man. After preliminary tests and field trials, 57,000 people, mostly in Brazil, were inoculated with the modified virus in 1938. During 1939 more than a million people were vaccinated against yellow fever.

In our Minnesota investigations on viruses during the same period, the virus of distemper was passed serially through ferrets, and the decrease in the virulence of this virus for canines was carefully determined. After fifty-four passages the virus produced uniformly mild infections in foxes and dogs. The live modified virus has been used to inoculate more than 100,000 foxes and 1,000 dogs.

It now appears that passage of certain filterable viruses successively through one species of animal decreases their virulence for unrelated species. Indications are that the property of modification is more or

less a general one, and that the use of live modified viruses as vaccines may in the future be the outstanding method of attack in controlling virus diseases.

Discussion

DR. JAMES JOHNSON, Minneapolis: What have been the conclusions in regard to this extensive vaccination against yellow fever?

DR. GREEN: The process of immunization against yellow fever as a field study is still too new to permit drawing conclusions. In preliminary experimental work, it was shown that this virus would produce antibodies in the blood which were considered, from mouse-protection tests, to be sufficient for protection against yellow fever. Similar tests are being made on individuals vaccinated in the field inoculations to determine the degree of immunity produced.

DR. RODDA, Minneapolis: Is the modified distemper virus now being used for the immunization of dogs?

DR. GREEN: Field studies are now being carried on in the vaccination of dogs by veterinarians, and it seems that a single inoculation with a modified distemper virus produces a satisfactory immunity in dogs. Such a vaccine cannot be made available for general use until extensive field trials have been completed.

The meeting adjourned.

A. G. SCHULZE, M.D., *Secretary*.

The prognosis of pleurisy with effusion with negative, doubtful or extremely slight pulmonary findings by x-ray is excellent if patients receive at least four months of sanatorium care; in fact, it is almost as good as the normal population in the same age group.—FRANCIS B. TRUDEAU, M.D., *Amer. Rev. of Tuberc.*, (Jan.) 1939.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

OPERATIVE SURGERY. Fifth Edition. J. Shelton Horsley, M.D., LL.D., F.A.C.S. Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va.; and Isaac A. Bigger, M.D. Professor of Surgery, Medical College of Virginia Hospitals, Richmond, Va. 2 Vols. 1,567 pages. Illus. Price, \$18.00, cloth. St. Louis: C. V. Mosby Co., 1940.

PSYCHIATRY FOR NURSES. Louis J. Karnosh, B.S., Sc.D., M.D. Associate Clinical Professor of Nervous Diseases, School of Medicine, Western Reserve University, Director of Neuropsychiatry, City Hospital, Cleveland, Consulting Neuropsychiatrist, Cleveland Clinic; and Edith B. Gage, R.N., Supervisor, Neuropsychiatric Division, City Hospital, Cleveland. 327 pages. Illus. Price, \$2.75, cloth. St. Louis: C. V. Mosby Co., 1940.

THE POISON TRAIL. William F. Boos, M.D. 380 pages. Price, \$3.00, cloth. Boston and New York: Hale, Cushman & Flint, 1940.

THE MARCH OF MEDICINE. Edited by the Committee on Lectures to the Laity of the New York Academy of Medicine. 168 pages. Price, \$2.00, cloth. New York: The Columbia University Press, 1940.

DOCTORS IN SHIRT SLEEVES. Musings on Hobbies, Meals, Patients, Sport and Philosophy. Edited by Sir Henry Bashford. 294 pages. Price, \$2.50, cloth. New York: Veritas Press, 1940.

ENDOCRINE THERAPY IN GENERAL PRACTICE. Third Edition. Elmer L. Sevringhaus, M.D., F.A.C.P.

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Complete literature on Silver Picrate as used in genitourinary and gynecological practice will be mailed on request.

*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, *AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES*, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

Professor of Medicine, University of Wisconsin; Editor, Department of Endocrinology, Year Book of Neurology, Psychiatry and Endocrinology. 239 pages. Illus. Price, \$2.75, cloth. Chicago: Year Book Publishers, 1940.

DERMATOLOGIC THERAPY IN GENERAL PRACTICE. Marion B. Sulzberger, M.D. Assistant Clinical Professor of Dermatology and Syphilology, Skin and Cancer Unit of the New York Postgraduate Medical School and Hospital of Columbia University; Associate Attending Dermatologist, Montefiore Hospital, New York City; and Jack Wolf, M.D.; Attending Dermatologist and Syphilologist, Skin and Cancer Unit of New York Postgraduate Medical School and Hospital of Columbia University; Director of Dermatology, New York City Cancer Institute. 680 pages. Illus. Price, \$4.50, cloth. Chicago: Year Book Publishers, 1940.

PRINCIPLES OF SURGICAL CARE—Shock and Other Problems. Alfred Blalock, M.D. Professor of Surgery, Vanderbilt University School of Medicine, Nashville, Tenn. 325 pages. Illus. Price, \$4.50, cloth. St. Louis: C. V. Mosby Co., 1940.

AN INTRODUCTION OF BIOCHEMISTRY. Second Edition. William Robert Fearon, M.A., Sc.D., M.B., F.I.C. Fellow of Trinity College, Dublin. Member of the Royal Irish Academy. 475 pages. Illus. Price, \$3.75, flexible binding. St. Louis: C. V. Mosby Co., 1940.

CHEMISTRY AND MEDICINE. Papers presented at the Fiftieth Anniversary of the Founding of the Medical School of the University of Minnesota. Edited by Maurice B. Visscher, Professor of Physiology at the University of Minnesota. Cloth. Price \$4.50. pp. 296, illus. Minneapolis: The University of Minnesota Press, 1940.

Chemistry, despite the disclaimer in the foreword of this book, is by all odds the most important single factor in the development of modern medicine and it was therefore most appropriately chosen as the single theme of the program for the commemoration of the completion of the first semi-centennial of the University's Medical School. Seven of the fourteen papers are by members of the University's own faculty, the others by teachers from other centers. All are by workers of acknowledged standing in the various subjects they have chosen, in which they have all done important original research.

It follows logically, then, that the volume is one of great value. It is divided into four parts, covering the physical, the metabolic, the immunologic and chemotherapeutic, and the neurologic aspects of chemistry in medicine, adequately illustrated by excellent charts and graphs drawn in the Medical Art Shop of the University, with a few half-tones from other sources.

Obviously the main object of the book is to preserve in permanent form these valuable contributions, both for the benefit of those who attended the sessions and those who were unable to be present, as stated in the foreword. To this extent it is a complete success, and one can readily understand that from its non-encyclopedic nature it was not meant to be regarded in any sense as a text book or even have the appearance of an attempt to make it look like one. Yet with the wealth of authoritative material which it contains it could have been made much more useful if it had been

provided with a uniform system of alphabetical reference lists, properly numbered, and given an index. It is like a rich feast served in the dark, or at least without a bill of fare.

GILBERT COTTAM, M.D.

DIAGNOSTIC STANDARDS AND CLASSIFICATION OF TUBERCULOSIS. Published by the National Tuberculosis Association, 50 West 50th Street, New York City, 1940.

Currently accepted standards in diagnosis, treatment and prevention of tuberculosis are given in the new edition of "Diagnostic Standards and Classification of Tuberculosis." It incorporates many ideas of physicians who gave the Standards in the tentative edition, published in 1938, a practical trial during the last two years.

Some of the changes in the new edition are in terminology. The terms "primary" and "reinfection phases," are used to replace the terms "childhood type" and "adult type," respectively. This change is due to the fact that primary infections occur in adult life more frequently than formerly simply because fewer children become infected. The term, "frankly active," is now employed to include the cases formerly classified as "improved and unimproved," though these terms are retained as subdivisions.

The section presenting the pathogenetic development of pulmonary tuberculosis discusses fully the primary reinfection phases of tuberculosis, initial lesions, prevalent types of retrogression and progression, and the histologic characteristics of the two phases of the disease.

The necessary correlation of the clinical symptoms of tuberculosis with the pathological course of the disease is emphasized and many such correlations are given as illustrations.

The diagnosis of tuberculosis is discussed from the standpoints of pulmonary tuberculosis with and without symptoms, the primary phase of the disease, non-pulmonary tuberculosis and differential diagnosis.

Tuberculosis case-finding and control are dependent upon the mutual understanding and coöperation among physicians, clinics and health organizations, according to the publication. The rôle of the private physician is pointed out as a major one.

The form sheet, "Classification and Descriptive Summary of Tuberculosis," is more comprehensive than any previous one. This form, when used, will give on brief inspection a full picture of the patient regarding medical history, evaluation of symptoms, physical, roentgenographic and sputum examinations, treatment, clinical status and complications.

The technical procedures in the diagnosis of tuberculosis are fully presented. The methods and the interpretations of the intracutaneous tuberculin test are discussed, as well as the demonstration of the tubercle bacilli in the sputum, stomach washing and other body fluids.

The x-ray is pointed out as the foundation of early diagnosis, and the many factors involved in the taking of the x-ray and the interpretation of the film are evaluated.

MINNESOTA STATE MEDICAL ASSOCIATION

Eighty-seventh Annual Session

April 22, 23 and 24, 1940

Rochester, Minnesota

HOUSE OF DELEGATES

Sunday, April 21, 8:00 P. M.

The first meeting was called to order at 8:00 p.m., Sunday, April 21, by Dr. W. W. Will of Bertha, Speaker of the House.

Following a report from Dr. E. S. Boleyn, Chairman of the Committee on Credentials, that a quorum was present, it was moved, seconded, and carried that reading of the minutes of the last meeting be dispensed with and, at the request of the Speaker, Dr. W. F. Braasch of Rochester introduced Dr. Nathan B. Van Etten of New York City, President-elect of the American Medical Association. (Dr. Van Etten's Address will be printed in full in a future issue of MINNESOTA MEDICINE—Editor.)

The Speaker then requested Dr. Adams to introduce Dr. R. G. Arveson, President of the Wisconsin State Medical Society.

DR. ARVESON: I am very glad to know that Dr. Adams comes from Wisconsin, and I would like to invite you all to Wisconsin next year to help us celebrate the 100th Anniversary of our organization as a continuous state medical society.

Wisconsin, especially western Wisconsin, owes a great deal to Minnesota. In western Wisconsin, we have made your medical centers ours and your men have been very willing to come across the state line and teach. Furthermore, before I go farther, I want to say that your executive secretary knows no state lines medically and has done much for western Wisconsin. In fact, I have talked so much about Minnesota to my Council and House of Delegates that they are on the verge of deporting me.

Wisconsin has been pushed around a good deal of late. The federal government threatened to make us pay an income tax and a large number of trips back and forth to Washington have been necessary, also the aid of an influential Minnesotan, before that threat could be removed. It would seem that the statement made recently by Hogan of the American Bar Association is right: This nation is fast becoming a government of men, not of law.

Some of you probably know that there has been a good deal of criticism of the Wisconsin State Medical Society in the Wisconsin legislature. We sent Mr. Crownhart to Europe to refute the arguments of some of our legislators and social service workers about the general excellence of the European system and we sent a committee around the state to investigate the adequacy of our own system in Wisconsin. We had planned to spend two or three Saturdays at it. Actually we spent the week-ends of nearly nine months. We talked to industrialists, mayors of cities, sheriffs, scrub-women and WPA workers and, gentlemen, we found not one instance where a physician had refused medical care or failed to see that it was provided; not one instance where a physician had failed to play ball with his patient.

We attempted in Wisconsin to establish a state-wide hospital insurance but the hospitals have taken it out of our hands and though it is now being pushed in Milwaukee, the outlook is not very hopeful. The CIO is fighting it in Milwaukee and x-ray and pathological services are being included in defiance of the law. We should probably have left it to the hospitals to handle

from the start. In any case, a great war is on and will probably be carried to the Supreme Court eventually to decide whether or not the hospitals can practice medicine.

The Wisconsin State Medical Society presents its best wishes through me for a successful meeting in Minnesota.

Dr. Will then introduced Dr. B. S. Adams of Hibbing, President of the Minnesota State Medical Association. (The Presidential Address of Dr. Adams is printed in full elsewhere in this issue—Editor.)

Dr. Felix Hennessy of Iowa, President of the Iowa State Medical Society was introduced.

DR. HENNESSY: May I extend to you the greetings of the 2,430 members of organized medicine in Iowa.

As I observe this House of Delegates meeting and as I have looked at ours over a period of many years, I have wondered if the message of what is going on here and in the practice of medicine everywhere is really being carried back home to the members and to the public.

We representatives are likely to debate the issues of medicine with complacency in our meetings but the general practitioner at home is outside of the combat, and, so far as he is concerned, our words fall on barren ground. It is through him that we must carry our message to the public. If we reach the public properly it is certain that we shall find appreciation and assistance.

DR. WILL: Thank you very much, Dr. Hennessy. I hope our delegates here assembled will take to heart what you have said about carrying the message home to our members.

You are all familiar with the re-organization plan in the state government of Minnesota. You are aware of the fact that Mr. Walter Finke heads the new Division of Social Welfare, and I am told by people who are in a position to know, that a better selection couldn't have been made. It is evidence of Mr. Finke's appreciation of the importance of medical problems of his department that he has appointed a medical advisory committee to aid him in the solution of these problems. Dr. A. W. Adson is Chairman of this committee and he will explain the functions of this committee.

DR. ADSON: I must confess that I was somewhat suspicious at the outset of the object back of the appointment of the Medical Advisory Committee. It occurred to me that perhaps we were appointed only to whitewash certain activities that would be presented to us as a formality for our approval. It was not until we saw the first orders issued to the Welfare Boards that I, for one, was fully convinced that Mr. Finke was seriously seeking our help in the solution of the medical problems involved in administration of relief and social security aids.

At our first committee meeting we suggested that we utilize the County Contact Committees as advisory committees to local county welfare boards. I'm taking the privilege of reading excerpts from the first regulations issued January eighth to the local county welfare boards and based upon the suggestion of the committee.

"In handling medical care cases, every county welfare board and its staff members often face the need of decision which is primarily medical and outside of the province of anyone but a

physician to make. From the standpoint of the welfare board, three factors are present. They are produced by a mutual need of assistance, the need for medical care, and the comparative limitation of funds. Of these, the first and the last are the responsibility of the welfare board. They are usually known, tangible facts. The need for medical care, its duration and type, are within power of the physician only to determine."

Now, gentlemen, that's very important. You are all familiar with the conflicts that have arisen in all our counties with reference to the type of medical care necessary in a given instance and to what extent it should be administered. When funds are limited, relative needs for medical care assume a special importance.

To quote this bulletin further:

"To assist them in this problem many counties have used committees of physicians formally designated by the county medical society for this duty. This committee activity sponsored by the medical society and carried out with the close cooperation of the physicians has been of immense value to the county welfare boards and a very real contribution to the handling of local welfare problems. We are happy to report that on November 24, 1939, the State Medical Advisory Committee to the Division of Social Welfare, after study of medical care as it relates to the welfare program, formally went on record urging extensive use of local medical advisory committees."

"The State Medical Advisory Committee recommends that the present County Contact Committees act in the capacity of the County Medical Advisory Committees as herein specified until the next annual meeting of the State Medical Association when formal action can be taken to change the name of such committees."

It seemed wise to the committee, it should be pointed out, that the word "contact" be omitted in the name of these committees and that they be known as "medical advisory committees." Such a change will have to be submitted to you, perhaps, in the form of a resolution.

The functions of the county committees were outlined as follows:

"(1)—On request of the County Welfare Board, aid in solving any problem involving compensation for medical care and provision for receiving public assistance." Obviously the men who make up these committees should be alert and willing to cooperate—and if they are, Mr. Finke will certainly see that their opinions are respected.

"(2)—On request of the Board, to aid in solution of problems that arise in connection with emergency cases. On the request of members, to bring to the attention of the Welfare Board, problems that arise in connection with emergency cases."

"(3)—On request of the Welfare Board, to be available to assist in the solution of problems arising by reason of a difference of opinion on recommendations as between doctors."

"(4)—On request of the County Welfare Board, to aid in solving problems of patients waiting for admission to the University Hospitals and other types of tax supported hospitals and to advise relative to the economy that might be effected in the transportation costs through treating certain cases with local facilities."

As the state committee has met from month to month, many different problems have been submitted. We have given our best thought to solution of conflicts and adjustment of differences. But the arrangement means more than that. It means that the medical profession of Minnesota has an opportunity to participate in the discussion and to outline the plans in conjunction with the Division of Social Welfare in the handling of intricate problems. I believe that many of these problems will be amicably and wisely settled and that there will no longer be a struggle in Minnesota between two strong forces. I am convinced that Mr. Finke is sincere and that he is willing to work with us as a profession. If we will do our part, we may be able to set up a plan that will benefit everybody in Minnesota. We have the pleasure of having with us tonight both Mr. Finke and Dr. Hilleboe and I want to present Mr. Finke to you now, not only as a Director of the Division of Social Welfare, but as a humanitarian who is genuinely interested in the solution of public problems that confront us in Minnesota. Mr. Finke.

MR. WALTER FINKE, Director of the Division of Social Welfare: I should like to state for you briefly

the four or five principles that govern our working relationship as we advance in these welfare programs in Minnesota.

First, I think it is important that the state should put its own house in order administratively before it asks any profession to work with it in the solution of any of its problems. Nothing is more difficult than an effort to deal with government when administrative responsibility is divided between numerous agencies and individuals and when there is overlapping and disagreement. We believe that we have taken the first step toward removing such obstacles in Minnesota. We have thrown together into one hat all of the diverse agencies that were previously concerned with the welfare program and we have definitely clarified administrative responsibility so that you can now point out who is responsible for what and definitely put your finger on the person, the bureau, and the unit which is charged with carrying out the program in which you are interested.

We are trying to create one state agency and one county agency in each county which will, between them, handle all the problems of social welfare. I think you will be interested to know that, as a by-product of integration and consolidation, we have been able to reduce staff and overhead expenditures substantially. Whereas, previously there were some 425 to 450 people in the various state offices concerned with this general program we now operate on a stabilized staff of 275 people and we are getting broader service and we are making better use of the qualifications and abilities of those who are on our staff. Of course the reduction in administrative expenditure is in proportion. It is our aim to put your welfare programs on a business basis because I believe that the administrative performance of a welfare program should be judged by the same standards as the accountant applies to a private business.

In our approach to the medical problems in the field of welfare, all of us know the importance of sound administration; but we are also proceeding upon what seems to me to be a basic premise—that the way to solve the medical problems of a welfare program is through, by, and with the medical profession itself. Since we started operation of the newly created Division of Social Welfare, no policy and no principle affecting medical care in any of these programs has been made or released until it has been approved by our Medical Advisory Committee. And that, gentlemen, will be a fixed policy of that Division as we proceed to administer these programs through the coming years. (Applause).

Likewise important for your consideration, I think, is the fact that we base our administrative procedure upon the theory of decentralization. We believe in the soundness of participation by local persons, in a local community, in a local unit of government, in the responsibility for administration of the problems connected with a welfare program. And so we operate in this state very soundly, I believe, through eighty-seven county welfare boards. Wherever it is possible, decision and responsibility are turned back to the local unit of government to be exercised by local people with knowledge of local conditions. This fact is important in working out our medical relationships. Medical problems must be solved wherever possible, on the local level, also, and by local people. The interest of the state is to see that certain broad general principles hold throughout all counties so that there is no discrimination as between geographic divisions in the state; also to act as umpire if necessary to assist local people in solving disputes.

Thus we have created a structure made up of local medical advisory committees subject to general policies which are worked out through our statewide Medical Advisory Committee which meets regularly each month with us in St. Paul.

Notice I say "we have created a structure." I do

not say that we have found a panacea because I do not believe we are going to hit upon any one idea that will suddenly solve all of our welfare problems for us. We must expect to find the answers the hard way—and the hard way is to work out our problems, detail by detail, until, eventually, concentrated effort finds the solution.

We now move into the second part of our process—that of making the structure, which we have created, work. And it won't work unless we have the full co-operation and interest of the medical profession itself. The form, standing alone, is worthless. It only becomes valuable by your own participation and willingness to work. We think our structure so far is sound. We have made tremendous progress, so far, in local participation and in raising standards of performance. I have every reason to believe that much will be accomplished, likewise, in raising the levels of coöperation between county welfare boards and county medical committees.

You will perhaps be interested to know that we believe the work of our Division must be characterized by openness of mind. We are willing to face our problems squarely without pre-conceived opinions and biases. We want the opportunity to sit down with those who are interested in any given problem and arrive jointly at solution. We recognize, for instance, that the general practitioner is probably the person most concerned in the medical problems of the county welfare board and that reference of welfare clients to a specialist should come best through him, so far as beneficiaries are concerned. In all cases, we hold fast to the idea that medical problems ought to be answered by medical men and not by others in some other field of activity. Upon that basis, I'm here to ask your continued help and coöperation in working out our problems in Minnesota.

Frankly, I have been amazed at the response which has been obtained from medical men in the various counties and that kind of response, I know, will continue.

I often see statements to the effect that this set of circumstances and that set of circumstances represent democracy at work. To me that's a static concept. I would rather turn it around and put it this way. If we are to get anywhere, we must work at democracy and in the process of working at democracy we find that thing we seek. If you are willing to work with us, we may together improve the health and welfare of all of the people of the state of Minnesota.

Dr. Adson then introduced Dr. H. E. Hilleboe, Medical Coördinator of the Department of Social Security and Chief of the Medical Unit of the Division of Social Welfare.

DR. HILLEBOE: When our State Medical Advisory Committee was first organized, I was a little bit doubtful about asking the men to come down to consult with us too frequently. Mr. Finke shared my feeling and suggested that perhaps the Committee could meet every three months at the time of the Council meetings. It is certainly to the credit of committee members that one of them got up and said, "We feel this work is too important to sandwich it in with other medical work. For a while, at least, and for as long a period as necessary we should meet at least once a month." In the intervening months since November it has been possible to set up medical policies relating to the use of County Medical Advisory committees, to Old Age Assistance and to Aid to Dependent Children.

Now we have started on the tremendous job of looking into the program of medical care for relief clients, and, frankly, we wish to take about six to nine months to study this program from a medical as well as the welfare point of view.

Our field representatives have already begun to accumulate information from the welfare board side of the picture. They have been instructed to find out

from the county secretaries if the relationship in their counties with the medical group is satisfactory. If it is satisfactory, no additional information is sought. If it is not satisfactory, then we ask for additional specific information. We hope that by July first we shall have the information from each of the eighty-seven counties and, at that time, we are going to ask our Medical Advisory Committee to recommend to the Council that Mr. Rosell or some other representative go with me to the medical societies in each of the counties where there have been difficulties to try to get at the problem. By the end of the year, then, we hope to take the picture as seen by the welfare boards and the picture as it is seen by the medical societies and bring the two together. By that method, perhaps, we can find the misfits and do something about them.

It has not yet been mentioned that Dr. Chesley is an ex-officio member of our Medical Advisory Committee. His membership is very important because it means that in the development of our program we are not overlooking the important part played by the State Board of Health and its various divisions. It means, too, that there will be no duplication in the development and execution of the program.

It may interest you also to know that we have in our office the obligation of consulting with the Director of the Division of State Institutions and that, for the first time in the history of Minnesota, all of the medical work that is not under the State Board of Health is in one unit. To give you an example of just what that means: One of the first things we are going to study in the state institutions is the use of drugs. In 1938, for example, \$90,000.00 was spent for drugs in nineteen institutions. A preliminary survey showed, also, that over 900 different schedules were on the drug list. The question of whether all of the 900 are in the United States Pharmacopeia or in the New and Non-Official Remedies certainly needs investigating and this investigation will be part of a consultation service for the institutional program.

So far we have had excellent coöperation from all of the non-medical people in the Division of Institutions and the Division of Social Welfare.

There are three things to be considered in all these activities: First, the needs of the patients; second, the practitioners who will be available to render needed service and third—and equally important, the limitation of funds available. Thank you.

Dr. W. W. Will next introduced Dr. Chesley.

DR. A. J. CHESLEY: There was one title that was not read for Dr. Hilleboe, that is Assistant Surgeon of the United States Public Health Service. This is a very important title because it gives him an important relation with the United States Public Health Service, a relation which is essential to the kind of work he is doing.

Mr. Finke also has very important relations with the Federal government since a very large amount of money used in welfare work comes to the state under provisions of the Social Security Act. Mr. Finke is the one man who represents Minnesota at Washington on all these questions of relationship, and he takes his advice on all matters relating to medicine and also public health from Dr. Hilleboe. While Dr. Hilleboe was with the old State Board of Control he worked closely with the State Board of Health and we gained confidence in his judgment and admiration for the way he does things. We're very fortunate in having him, as an officer of the United States Public Health Service, here in the state in this position. Thanks, of course, to the Governor's recognition of his ability and of the unique opportunity presented of keeping him here in this dual capacity.

My part on the State Medical Advisory Committee is simply to listen in. I have no vote but I'm very glad to have the privilege of knowing what they are doing.

We have a very good Committee. I don't know if they are much better than the State Board of Health but, of course, they are all doctors and on the Board we have a variety.

The finances under which we operate in the Department of Health continue to come partly under Title V of the Social Security Act from the United States Public Health Service and partly under Title VI from the Children's Bureau. Congress makes the appropriations under the law at each session. In the case of the Children's Bureau, it is implied but not exactly stated that the Chief will consult state and territorial health officers before setting down regulations to govern their use. In the case of funds under Title VI, the Surgeon General is required by law to consult the state and territorial officers with regard to regulations governing allotments which he recommends to his superior, now Mr. McNutt, for adoption. In Minnesota, we use funds from both sources to pay some of the salaries of public health nurses, for instance, and our program is of necessity worked out between the Children's Bureau and the United States Public Health Service.

As you perhaps know, Congress amended the Social Security Act to require a merit system. Our State Civil Service Act fulfills the requirement so far as state employees are concerned but does not cover some of these local employees whose salaries are provided by Social Security funds. For these employees, then, we shall have to work out something to meet the requirements of the Federal Act or there will be danger of losing the aid allotted to Minnesota. Inasmuch as the same thing applies to employees of many county welfare boards, also, I have been waiting for Mr. Finke to take the initiative because the state receives, relatively, \$1,000.00 for relief and welfare purposes to ten cents for health purposes. Furthermore, the qualifications set up so far can well be met by anybody that we employ. Health officers have always been in favor of increasing the standards and requirements for public health workers. They have not been in favor of the use by federal authorities of the terms "you must, you shall, you will, or else," because, after all, at least a part of their money comes from the citizens of Minnesota.

The whole matter will come up for discussion at the Surgeon General's Conference in May and this is a very important session because a good many issues that really deal with state medicine in implication, though not in so many words, are likely to come up. Many of these issues seem of small immediate concern but they must be examined with consideration for the principle involved. I believe that some of the people who talk so much about broadening the social structure and the expanding needs of the public health forget that public health is merely a branch of medicine and that there would be practically no organized public health work in the United States if there were no medical organizations. As you know, it was the Minnesota State Medical Association which put through the bill providing for the State Board of Health in Minnesota. That was in 1872 and Minnesota was the third state to establish such a board. Members of the Board furthermore have been selected with very little idea of political advantage by our governors. We have distinguished medical men with no axes to grind on the Board. They receive no salaries; there are times when they get better than a sixty-five cent luncheon—that's when I can't get them into a place where I can give them a a sixty-five cent luncheon.

People like these who take the time to study our problems solely from the obligations of citizenship and their feeling of obligation to the profession are not going to go very far wrong in what they decide to do.

Tomorrow morning the members of our Board will meet with your Council and any questions which are brought up there and may need your attention will be brought to you. I take pride on being invited here

to talk to you and in having your confidence. I feel sure you can trust the Board to consider carefully all of the problems that the new programs present to them and to consult your Council before any new policies are established. As you know, we asked and received the sanction of the House of Delegates a few years ago to use the Council as an Advisory Committee to the Board on all matters of policy and especially on those related to aid secured under provisions of the Social Security Act.

In addition, a representative of your Association, Dr. Theodore Sweetser, faithfully attends every meeting of the executive committee of the Board. You will be interested in the fact, also, that we have Dr. O. O. Larsen of Detroit Lakes as president, this year, of the Minnesota Sanitary Conference. The Conference hasn't much money but President Larsen attends the meetings anyway at his own expense. I think we have a good man, there, too—reasonable, progressive and courageous. If he sees a point that involves a principle he fights for the principle regardless of who may disagree with him.

It seems to me that our public health program is in good hands in Minnesota.

Dr. J. F. Dubois made a report which was not recorded from the State Board of Medical Examiners.

Mr. John Pratt, Executive Secretary of the National Committee of Physicians for Extension of Medical Service, was introduced by Dr. W. F. Braasch. He spoke briefly but his remarks were not recorded. Dr. Braasch announced a luncheon meeting of the Committee to be held Tuesday, April 23.

Dr. W. W. Will called for a report from Dr. H. Z. Giffin, Chairman of the Council.

DR. GIFFIN: Dr. E. M. Hammes, Chairman of the Editing and Publishing Committee, reported to the Council today on the excellent financial status of MINNESOTA MEDICINE. There was a surplus this year of approximately \$1,600.00 and, after the supplement which you received with your January number was paid for, more than \$1,000.00 was transferred to the permanent fund.

The financial condition of the Association, as a whole, was also reported as excellent. The Fiscal Agency Account is now \$37,000.00 with a market value of something over \$35,000.00. The annual meeting last year showed a profit and the net surplus for the year 1939 was \$5,000.00 in spite of the fact that it was a legislative year and we had increased our office space and expanded our educational program. It was decided by the Council that the Finance Committee should use its own discretion as to disposition of this surplus. If it seems wise, the Committee will add it to the Fiscal Agency Account.

The action taken recently by the House of Delegates of the Oregon State Medical Society criticizing the exhibit sent by the Mayo Foundation and Clinic to the San Francisco Exposition and objecting, also, to the pictures and text which recently appeared in *Life* was discussed. The councilor for the First District presented the facts in connection with both matters and a committee of five consisting of three councilors, the president, the immediate past-president as ex-officio members was appointed to review them in detail and report to the Council and subsequently to the House of Delegates tomorrow.

Representatives of the three insurance companies, the Aetna, the Medical Protective and the Lumbermen's Mutual, which sell malpractice insurance in Minnesota, appeared before the Council and discussed their respective policies. The gist of these discussions will be summarized and presented to you later.

Dr. J. C. Hultkrans, Chairman of the Committee to Study Motor Vehicle Accidents, presented a preliminary report for his Committee which was accepted by the Council and which he asked me to present to you here. The committee reports the opinion that the specificity and reliability of chemical tests for the presence of alcohol in the blood has not been completely and satisfactorily established. They suggest, therefore, that no specific methods for testing volume of alcohol in blood and no specific percentages to determine intoxication be recommended for legislation at this time. They wish to go on record encouraging further studies looking to future legislation in this matter.

Dr. L. R. Critchfield, Chairman of the Committee on Vaccination and Immunization, presented a supplementary report for his Committee which was approved by the Council and will be presented to you later here. Dr. W. A. Coventry of Duluth and Dr. W. F. Braasch of Rochester were nominated by the Council for re-election as Delegates to the American Medical Association with Mr. J. C. Hultkrans of Minneapolis and Dr. W. L. Burnap of Fergus Falls as Alternates.

The statement of membership presented to the Council showed an increase of approximately 100 members since last year, and Dr. C. A. Hobbs and Dr. A. E. Booth of Minneapolis, Dr. Fred Sheppard of Hutchinson and Dr. D. P. Dempsey of Kellogg were granted Affiliate memberships.

It was voted to permit the Division of Social Welfare to use any records or surveys made by the State Association which are not of a strictly confidential nature, provided these records are presented through the medium of the State Medical Advisory Committee.

Dr. W. W. Will here called for the report by the Chairman of the Reference Committee on Medical Education reports, Dr. F. W. Lynch of St. Paul. The following committee reports were reviewed:

REPORT OF THE COMMITTEE ON DEAFNESS PREVENTION AND AMELIORATION

Your committee reports a noticeable increase in interest among the medical profession and laity in the problem of conserving the hearing.

A number of communities have recently for the first time included in their school health programs the periodic testing of their pupils by modern methods.

There has been an increased demand for lectures by public health, parent-teacher, nursing and public service groups for hearing surveys and information regarding the subject. This demand has been met by members of this committee. Numerous inquiries from school authorities for specific information concerning audiometers and hearing aids have been received and answered. The opportunities for more effective work in this field have never been as great as today. The recent release of reliable audiometers at a low cost, and of greatly improved hearing aids, which meet the requirements of the Committee on Audiometers and Hearing Aids of the Council on Physical Therapy of the American Medical Association for such instruments greatly increases the possibilities of attainment in this field of preventive medicine. Your Committee advises that in the prescribing of hearing aids or the purchase of audiometers for clinical use, members of this association will wisely choose instruments which have been approved as "acceptable" by the Council.

A careful study of the situation reveals increased recognition of the need of a practical program to be administered through the cooperative efforts of the State Board of Education, the State Board of Health, the State Public Health Association and the State Medical Association as the logical agencies whereby the hearing, especially of school children, can be safeguarded by means of periodic, standardized hearing tests and the application of needed corrective medical and educational care. This need is especially acute in rural areas.

Contrary to our former teaching, recent research has shown that hearing deficiencies for the higher frequencies occur often among young children and are frequently the first indication of ear disease resulting from tubal obstruction. If undiscovered and uncorrected, this leads to hearing deficiencies of a handicapping degree. This fact emphasizes the importance of translating recently acquired knowledge of ear diseases into legislative and administrative action as has been successfully accomplished in several other states and in many local communities.

Your committee at the present time in cooperation with interested agencies, is working on a tentative, practical program whose application will meet the existing need in Minnesota. The active interest of every medical man will be

needed to help put such a plan into action as a public health measure.

We respectfully recommend that in keeping with its larger field of activity, the name of the committee be changed to read "The Committee on the Conservation of Hearing."

We further recommend that the committee be enlarged, subject to the approval of the President and the Council, by the appointment of interested physicians as additional members from different parts of the state, to more effectively carry on its objectives in their respective communities.

HORACE NEWHART, M.D.

COMMITTEE ON SYPHILIS AND SOCIAL DISEASES

No significant change has occurred in the last year in Minnesota's fine venereal disease program. New funds allotted the State Department of Health have been used to finance special postgraduate courses for physicians; but the services of the State Department of Health have continued along their well-established lines and no new programs have been brought to the attention of the committee.

The effectiveness of Minnesota's program has been reflected in the steadily decreasing incidence of venereal disease in the state. The committee stands ready to advise on any matter that is brought to its attention but sees no need for the present for any special campaign for the control of either syphilis or gonorrhea in Minnesota.

WALTER E. HATCH, M.D.

REPORT OF THE COMMITTEE ON VACCINATION AND IMMUNIZATION

It has been pointed out in studies of comparisons of death rates made by the Bureau of Medical Economics of the American Medical Association that diphtheria mortality provides a fairly accurate measure of the efficiency of the medical profession in any county or community. Government public health agencies may well be expected to use just such a measure in evaluating medical service in a given community.

By that measure the medical profession of Minnesota has made a fine record for itself. The death rate last year was 0.3 per 100,000 population, while the rates in many German cities rose to 11 per cent and more.

There is another way to look at the situation, however, and that is that even one diphtheria death is unnecessary and could be prevented if every medical society in the state were launched upon a regular annual program of immunizing and vaccinating the children of its community.

The smallpox situation is undoubtedly more serious than the diphtheria situation, since there has been a gradually rising smallpox case and death rate over the last few years in Minnesota. At the same time, the absence of any major smallpox scare since 1924 has lulled many people into neglect of vaccination. An epidemic of malignant smallpox at this time—and such an epidemic is more than a possibility—would find many people unprotected.

The responsibility for preventing such a catastrophe and for reducing our diphtheria death rate to zero in Minnesota CAN BE AND SHOULD BE assumed by the medical profession. This has been the established policy for many years of the Minnesota State Medical Association and the policy was reaffirmed this year with the creation of this committee by the Council.

It is well known, of course, that a large number of our societies have been regularly engaged in immunization programs for some time. In many cases, the programs are well established and working satisfactorily. In some other communities the physicians have done the work sporadically and unsatisfactorily both to themselves and the community because of the lack of well-coordinated working plans or because no funds were available to pay for service to indigent children of the community or for some other reason which proper organization might have removed.

The results of community protections of this sort are so obvious and so dramatic that every American community will eventually demand them, and it is certain that, if the physicians of the community do not set the program in motion, government agencies will come in and undertake the work.

Therefore, it is the object of this committee to promote county and district medical society programs for immunization and vaccination in every community wherever such programs are not already in existence and working effectively.

A survey of all societies to see what is already being done and what the immediate needs may be is already under way. The committee is also studying model community plans including preparation and management, actual procedures, fees to be charged, etc., to give to any society that requests it as an aid to establishment of new programs. It is hoped that a report on the survey may be ready soon and that, as a result of this new effort, no child in Minnesota will reach school age without having been offered the opportunity for protection against these two scourges.

In the meantime, members and society representatives are invited to write to this committee for any information the committee may have in its files on this subject and also for speakers at their own meeting or for public groups in their communities.

L. R. CRITCHFIELD, M.D.

REPORT OF COMMITTEE ON MATERNAL WELFARE

A request was received through Dr. Adams for obstetrical information for the State Department of Highways and a letter was sent to Mr. Eldon Rowe, Chief Highway Patrol Officer,

outlining the directions and instructions for highway patrolmen when a baby is born on the highway. This information has been sent by Mr. Rowe to all patrol officers with instructions that it be kept in a convenient place for reference if such emergency arises.

Mention is made of the coöperation between the State Maternal Welfare Committee and the State Department of Health relative to the changes in the birth and death certificates; as yet this work is not completed but we feel that much valuable improvement will be made when the Division of Birth and Death records and Vital Statistics of the Department of Health have completed this work.

RUSSELL J. MOE, M.D.

REPORT OF THE COMMITTEE ON OPHTHALMOLOGY

Optometrists have been very insistent of late upon development of a system for testing the eyes of automobile drivers on the highways.

They have appeared before the Safety Council with their program and also before the Safety Division of the State Highway Patrol.

No action in favor of their program has been taken by either agency as a result of efforts of this committee and the State Office. We have been assured, in fact, that nothing of the sort would be approved or incorporated in their program.

Changes in the Drivers' License Law are being considered, however, and a sub-committee of the Committee on Traffic Legislation of the Minnesota Safety Council is now being formed which will consider all of the medical factors involved in safe driving. In connection with the formation of this sub-committee, Mr. W. F. Rosenwald, chairman of the Traffic Safety Section of the Safety Council has asked us to appoint an oculist to act as medical representative and as sole consultant on vision and eyes for that committee.

J. S. REYNOLDS, M.D.

REPORT OF THE COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

The work of this committee has been concerned entirely with the Coördinated Medical and Public Health Program which is now in its second year.

Subjects for the new year were chosen at a general meeting of committee chairmen and officers of the association and were designed to confine the fields of discussion within narrower limits than the subjects of the first year.

The same general plan has been followed as before in assembling materials for the monthly packets. Wherever possible, statistical studies have been supplied by the State Department of Health and these studies, based upon the latest figures available, have been among the most illuminating and valuable of all the contributions to our packets.

New and well-written popular pamphlets such as those prepared by the Metropolitan Life Insurance Company have been secured whenever they were available and appropriate reprints have been purchased from time to time from *Hygeia*.

Considerable material prepared for recent courses at the Center for Continuation Study has been made available through the courtesy of the Department of Postgraduate Education at the University of Minnesota. This material is new, comprehensive, and authoritative, and it has greatly enhanced the value of our packets. In addition to these sources of material we have drawn several times upon our members for material, some of which was prepared especially to cover some important phase of the month's subject.

It was possible to secure, also, the valuable compilation of the Vitamin series, published last year in the *Journal of the American Medical Association* for those who requested the December packet. The volume was contributed to the packet by Mead Johnson and Company, and the Committee wishes to express its thanks not only to this company but to all the above who contributed so much to the interest and value of the packets.

That the packet is popular is amply proved by the growing number of requests for it. The monthly average is well above 250, and February requests totalled 300, and March requests exceeded 400.

Requests for speakers on the subject of the month have been handled through the Speakers' Bureau. The offer which has appeared in the newspapers each month in connection with announcements of the program to provide speakers for any interested organization has met with a surprising response and every effort has been made to provide well qualified speakers.

A considerable amount of newspaper publicity has accompanied each change in program, in addition to the regular weekly news stories all dealing with phases of the subject and released from the State Office.

Inquiries about the program have been received from many quarters outside the state, and United States Public Health service representatives in Washington are watching its progress with interest. They have particularly commented on the fact that it represents a practical coöperative effort between the state health department and the physicians in which both unite in an effective program under medical sponsorship.

Judging by more than a year's experience with the program, as well as by the interested comments of these on-lookers, the Minnesota State Medical Association appears to be well on the way in this program to the development of a most significant and far-reaching program.

A. H. WELLS, M.D.

REPORT OF THE COMMITTEE ON DIABETES

I wish to submit the report of the Diabetic Committee for the year 1940.

The new pamphlet *HOW TO MAKE DIABETES HARMLESS* has been revised, and has been released from the press. There are many changes in this new pamphlet. The diets are more liberal in carbohydrates, and there is more specific information in regard to insulin reactions. We have definitely described the reactions caused by protamine zinc insulin in contrast to those of regular insulin.

ARCHIE H. BEARD, M.D.

REPORT OF THE COMMITTEE ON CANCER

The work of the Committee on Cancer has been largely advisory during the last year. The chairman has served on the Executive Committee of the Women's Field Army of the American Society for the Control of Cancer, has provided speakers for meetings held under the auspices of the Field Army, and has supervised and approved educational material distributed through the women's organization.

This general supervision of public education material on cancer serves to standardize and coördinate our teaching about cancer and to avoid unfortunate conflicts in statements which have been made by public speakers in the past.

The committee has also advised with the Committee in Charge of the Coördinated Medical and Public Health Program in preparation of material for the packet on Cancer of the Digestive Tract, the subject for the month of April.

Inasmuch as April is also the month of the annual membership drive of the Women's Field Army, this choice of subject is particularly opportune and should serve to emphasize in the public mind the close coöperation now existing between the physicians and the Women's Field Army.

The fact that more and more cancer cases are coming in the early stages for treatment is proof enough of the soundness of a program of public education in elementary facts about cancer. This program should be fostered in every possible way as one of the best means open to us for controlling the cancer scourge.

M. W. ALBERTS, M.D.

DR. LYNCH: In conformity with the request of the Committee on Deafness Prevention and Amelioration, of which Dr. Horace Newhart of Minneapolis is Chairman, the Reference Committee suggests that the name of the Committee be changed to Committee on Conservation of Hearing and also that the Committee be enlarged. This Committee is asking for continued coöperation with the Committee on Public Health Education. He also requests, and the Reference Committee agreed, that all or a part of a monthly packet should be devoted to the subject of conservation of hearing. If only part of a packet is used for this purpose, the other part might well be used for the subject of conservation of sight. Speakers for county medical society meetings will be provided by Dr. Newhart's Committee. The Reference Committee recommends that this report be accepted.

A little addition was made to the report of the Committee on Syphilis and Social Diseases by the Reference Committee, calling attention to the fact that the State Department of Health has offered to diagnostic laboratories throughout the state the opportunity to coöperate in a program for evaluation of sero-diagnostic tests for syphilis. The results of the tests are to be confidential but members of this House should be informed of the plan. The Committee recommends that the report be accepted.

The report of the Committee on Vaccination and Immunization submitted is also recommended for acceptance. If the physicians themselves do not set a program of vaccination and immunization in motion, government agencies will come in and undertake the work. A tentative outline of procedure is supplied in the report. The Reference Committee recommends that Dr. Critchfield, the Chairman, be given an opportunity to present the program to the Delegates and pointed out the rising incidence of smallpox and the neglect of vaccination which has preceded and accompanied this increase.

Dr. W. W. Will then called for a supplementary report from Dr. Newhart.

DR. NEWHART: We bespeak the coöperation of all of you in bringing to the men in the individual county societies essential knowledge about the prevention of

unnecessary hearing loss. It is only by this means that we can bring our membership up to date on certain fundamental principles, some of them learned only during the last few years. Most of us, even including some of our Otologists, are today living in the horse and buggy stage and we must help our members bring themselves up to date before we can educate the public on these matters.

Dr. W. W. Will then asked for supplementary reports from Dr. D. W. Wheeler, Chairman of the Heart Committee; Dr. R. J. Moe, Chairman of the Committee on Maternal Welfare; Dr. J. S. Reynolds, Chairman of the Committee on Ophthalmology, and Dr. L. R. Critchfield, Chairman of the Committee on Vaccination and Immunization.

DR. L. R. CRITCHFIELD: The Committee on Vaccination and Immunization has made its first report to the House of Delegates. An outline for the County Medical Societies, who wish to carry on immunization campaigns against diphtheria and smallpox, has also been prepared for your approval. Before I read this outline to you, I should like to call your attention again to the fact that prevention of disease should be considered a community undertaking and responsibility. Doctors who do vaccination for fifty cents apiece in group immunization programs are performing a community service, and that fact should be clearly understood by the people of the community. If the work is done at these reduced fees in groups at schools and other convenient centers, there will be very little danger that people will confuse this community service with private practice in the doctor's office, and very little opportunity for the complaint, "You gave my child a vaccination for fifty cents, why should you charge me two or three dollars for some other hypodermic treatment?" In any case, vaccination and immunization of the children is a community undertaking in which many community organizations should cooperate, and which should be regarded by all as an essential part of the health protection of the community.

I. The local medical society should decide to institute and carry on a program of Immunization and Vaccination against diphtheria and smallpox. (*At a meeting of which advance notice is given to the members.*)

It is recommended that county organization be carried out in furthering the program. If several counties form one district a county club may be formed.

Some local newspaper publicity may be given to this action of the medical society.

II. The local medical society should appoint a Committee (*not temporary*) whose duties should include the following:

- A. Appraisal of number of children in the community.
 1. Those not immunized (*requiring immunization*).
 2. Those already immunized.
- B. Appraisal of resources for carrying on a program of immunization.
 1. Physicians—all members of the county society who so desire should be called upon.
By making this an undertaking of organized medicine, a means of controlling cut-rates and chiseling is at hand.
 2. Lay assistance—Various agencies should be called on to assist in the Program—such as the Parent-Teacher Association, the Red Cross, the Legion Auxiliary, Civic Clubs, the County Public Health Association, etc. The decisions as to the number of organizations should be reached early, but all who are interested should be invited.
 3. Public Health agencies should include, State Board of Public Health, District Health workers, and Public Health nurse of the county.
 4. Centers for work if group immunization is carried out. (This must be decided by the society or by the committee.)
 5. Publicity—
 - a. For the immediate undertaking.
 - b. For general health education.
 - c. For the medical profession.
 6. Financial resources—It may be well to consider this phase of the problem when selecting lay aid.

III. The local medical society or its authorized Committee shall decide—

- A. Whether immunization shall be applied in groups or individually in physicians' offices.

B. Immunizing material to be used—

1. smallpox—standard virus
2. diphtheria—
 - Plain (formalin toxoid) 3 doses at 1 month intervals
 - Alum toxoid 2 doses at 1 month intervals
 - Alum toxoid 1 dose
 - Alum toxoid 2 doses is, at present, considered to be the most effective material. (Comm. Evaluation of Administration Procedures—Am. J.P.H. March 1940.)

C. Age of children to be immunized—

1. Smallpox vaccination may be performed at any age.
2. The common practice at this time is to commence diphtheria immunization at 6 months of age.
3. It is recommended that a Program to immunize all children from 6 months to 10 years be undertaken at as early a date as possible. When this is accomplished, the effort required each year to maintain an immunized group will be much less.
4. Under 10 years of age 2 doses of Alum Toxoid one month apart are recommended.
5. Over 10 years of age 3 doses of (Plain) Formalin Toxoid one month apart are recommended.
6. The use of the Schick test may be dispensed with in group immunization work. It may be used for private patients if desired.
7. If a child has been immunized in infancy it is recommended that a single dose $\frac{1}{2}$ the size of the original immunizing dose be given when he enters school.

IV. The local medical group may request from this Committee a packet of materials used in various parts of the state including samples of letters, cards, etc., and suggestions for carrying on the program. The Minnesota State Board of Health will lend assistance freely in organizing a program.

V. Preliminary Contact work with lay groups includes—

1. Selection of lay assistance.
2. Assignments of locations and dates.
3. Publicity—
 - a. newspapers
 - b. schools
 - c. letters
 - d. blanks: 1. request for immunization (sent to parents).
 2. permanent records.

VI. Fee to be charged should be decided by local society. Refer to this Committee for suggestion as to fees.

VII. Set up for continuance of Immunization Program from year to year.

It appears to be true, at the present time, that group immunization has been more successful in reaching a high percentage of children in a community, than individual immunization. Nevertheless, some county societies are successfully carrying on Individual Immunization programs. It is evident that lay cooperation is most essential for the success of either method.

This Committee is prepared to render assistance to any local medical group who desire to carry on a thorough program of immunization, whether it be on a local basis or group basis.

DR. W. W. WILL: What do you wish to do with the supplementary report by Dr. Critchfield on Vaccination and Immunization?

DR. T. H. SWEETSER: Mr. Speaker. It seems to me that Dr. Critchfield's remarks represent a distinct change from the attitude of the Committee on Public Health Education on immunization and vaccination. If I remember rightly, the Committee on Public Health Education believes that preventive medicine should take a larger and larger part of the physician's time, but that all the work should be done, if possible, in the doctor's office. I recognize the difficulties involved in getting people to go to the private office of the physician for immunization in these programs. But it seems to me that a distinction should be made between the work that is done in these clinics and groups and the preventive work that is done in the private office of a physician, particularly the pediatrician.

DR. W. W. WILL: I wonder if there are any men here from the country who would like to talk about their experiences. I know that some of you have been asked to do this work for ten cents for vaccination and some for twenty-five cents. . . . If not, I will call on Dr. Barr to discuss the matter.

DR. R. N. BARR: I think that most of you have heard Dr. Sogge tell how they have handled immunization in his county. Of course, anything that I may

say on this matter represents only my personal reaction. We have checked through many reports, however, on immunization campaigns carried on in groups and otherwise, and we find that a much higher percentage of children is immunized under the group plan. I think we all recognize the importance of the question of contact between the individual physician and his private patients. The only solution I personally see for this matter is for the medical society to take up the immunization program as a part of its own program and as a part of its own contribution to the community health.

Beltrami County has done it for a number of years. They have charged a minimum, I believe, of fifty cents for each vaccination and seventy-five cents if a dose of toxoid is included. The funds thus earned went to the County Medical Society and the work was not done as a part of private medical practice. If the individual desires private service, he goes to the doctor's office and pays the regular fees. The result has been a very high percentage of pre-school and school children immunized against diphtheria and vaccinated against smallpox.

In many other communities, where there has been no comparable set-up, the doctors have got together and made plans but, unfortunately, two or three years have passed before they came to an agreement on the type of a program that they wanted to put on. And often it was not until the third year that the work was done. This is not a criticism of physicians but the fact is that the public is criticizing them because the large majority of our children is not immunized in Minnesota. The children are going to be immunized and it seems to me that the best solution is for the County Medical Society to do it. If the County Medical Society carries on a group program in the schools, then the work will be divorced from the individual practice of the physician in his office. Also there will be no question of cutting fees.

There are many other advantages in this type of program. In the first place, it does strengthen the relationship between the medical society and the people in the community. In addition, it puts a fair amount of money in the medical society's coffers to be used as the physicians see fit. Also it gives the County Medical Society leadership in this work and the State Board of Health and other groups, who are working for preventive medicine, can aid in the development of the program. It will put us in the position of helping the medical society to do the work. We should be able to provide sample cards, sample letters, and many other types of material to be used at the direction of the doctors in their own community. I think that it should be clearly understood that the State Department of Health does not wish to carry on these programs and will not do so in Minnesota. The physicians themselves must do this work.

DR. J. P. McDOWELL: We carried on the work in the schools in St. Cloud. Different doctors came out at different hours so that all had about the same amount of work to do. The money was turned over to the doctors who did the work, but the program did not reach the children in the country. I don't believe that we could get the country children in to be vaccinated and immunized unless we have a nurse or somebody to go out and round them up.

DR. E. S. PLATOU: I would like to say one word about this matter. Mr. Finke and his Division of Social Welfare are trying to decentralize the program of relief. It seems to me that this program of immunization should be decentralized in much the same way. The particular method to be employed in each community should depend largely on the conditions in that community.

The most important thing seems to me to be that we should coordinate all existing facilities to do this

work, and try to do it periodically, at the same time each year. These should be community campaigns, not state-wide campaigns. They should have the advice of the State Health Department and the County Medical Advisory Committees; of the County Welfare Boards as well. But every effort should be made to publicize the need of the thing to the people.

DR. L. L. SÖGGE: I think the important thing, as Dr. Barr and Dr. Platou said, is to get the work done. Our Southwestern Minnesota Medical Society is composed of four counties, a medical club in each of these counties. Each of these medical clubs get together and agrees on the plan for our immunization program.

In our county, there are 3,500 students. The county was divided for the purposes of the program into twelve stations, and this year we put on our third vaccination and immunization program. We have reached about 78 or 80 per cent of the school population, and about 50 per cent of the pre-school population through these programs. We divide the work up among the doctors who are nearest the stations selected. For instance, the doctors in Westbrook take all the school-houses near Westbrook; the same plan being carried out with all the towns in the county.

A certain time is set and the doctor goes to the schoolhouse selected. Mothers of pre-school children are informed that they must bring their children to the school at that time.

We get the assistance of the Farm Bureau people, the Parent-Teacher Association, and the superintendents of schools. We meet with the teachers in the fall and tell them what we are going to do and ask their cooperation.

People who can pay the fifty cents apiece for each child; if they have both immunization and vaccination, they pay one dollar. Those who don't want to pay or cannot pay are cared for through the Red Cross. There are no "ifs or ands" about it. The teacher keeps the record. The doctors in the county have, on the average, made better than \$25.00 an hour for the time they have spent at this work. We feel that that is all the pay we farmer doctors are entitled to.

I want to call attention also to the program of Mantoux testing for tuberculosis that was carried on last week and the week before by Dr. Slater, who is our Superintendent at the Southwestern Minnesota Sanatorium. For this campaign, we had places selected in the county and all the children were brought to those places. We had a splendid response.

DR. D. S. BRANHAM: It seems to me that the children of indigent families and of recipients of Social Security Aid should be given immunization and vaccination if they wish to take advantage of it. These children form a large group in the rural areas, and I do not see why the county relief board should not be able to authorize a fee for immunization just as they authorize a fee for other medical attention. I think it would be easier to handle the people who can afford to pay if the relief group could also be immunized.

DR. B. C. FORD: It might be encouraging to some of the men here to know that we have been quite successful in our county in having this work done in the doctor's office. The record would show that we take care of nearly 80 per cent of the children and we get one dollar for each immunization and each vaccination. I think we reach a large percentage of the children out in the country as well as in the city. We have carried on this program for about five years. Our Parent-Teacher Association works with us very cooperatively and is very strong, and this may have attributed largely to our success.

DR. W. W. WILL: Mr. Rosell, our Executive Secretary, says that he will take up the matter of financing

immunization and vaccination for the relief clients with the Welfare Board.

It was moved, seconded and carried that the supplemental reports of the Committee on Vaccination and Immunization be accepted.

It was moved, seconded and carried that the report of the Reference Committee on Medical Education reports be accepted.

Dr. W. W. Will then called for the report of the Reference Committee on Miscellaneous Scientific Reports, of which Dr. A. E. Cardle of Minneapolis was Acting Chairman. The following committee reports were reviewed:

REPORT OF THE COMMITTEE ON INTER-PROFESSIONAL RELATIONS

The Committee on Interprofessional Relations had its first meeting this year in Minneapolis, January 26, 1940.

At this meeting were representatives from the Hospital Association; Pharmaceutical Association; Dental Association; Nurses and Medical Auxiliary. All representatives were enthusiastic over the idea of having close contact with the medical profession.

They all approved of having an opportunity of sitting in with representatives of the medical profession for discussion of matters common to all. Some of the problems of the various professions were discussed. Government control was one of the main topics of discussion. All seemed to agree that to prevent this was our greatest problem.

It was the hope of those present that this relationship of the various professions be made state-wide. At the Secretaries' meeting in St. Paul, February 24, 1940, this group met at breakfast and again discussed the same problems. We also listened to representatives from various parts of the state where such meetings had been held in the past.

A plea was made at this time for each county secretary to make an effort to get representatives of the various professions together in his locality for the discussion of these same problems.

It was decided at our meeting in St. Paul to send out a questionnaire and a group of suggestions to each county secretary for his guidance in establishing local interprofessional groups.

J. M. HAYES, M.D.

REPORT OF THE HISTORICAL COMMITTEE

Your Committee held one meeting last year at which the work of the Committee was discussed. No new work has been undertaken this past year except preparing the material on hand for printing in MINNESOTA MEDICINE. A committee at Rochester, however, is preparing a history of medicine in Olmsted and the adjoining counties which no doubt will be available sometime this year. Your Committee has on hand sufficient material to furnish copy to MINNESOTA MEDICINE for the next two years. A number of the members of the Association and others have sent in additions and corrections to the material already published which will, at a later date, be added to the history. For this we are grateful. Your Committee hopes that others may send in corrections or additions if other corrections or additions should be added. Questionnaires have been sent by the Secretary of the Association to each member requesting biographical information. About 800 of these have been returned. As this material will be of great use to future medical historians it is hoped that those who have neglected to return the material will do so.

The Committee wishes to call your attention not only to the historical material published in MINNESOTA MEDICINE, but also to that which has appeared in *Minnesota History* and the *Journal-Lancet* in the past and present year.

J. M. ARMSTRONG, M.D.

REPORT OF THE COMMITTEE ON MILITARY AFFAIRS

1. *Commissioned Personnel.* Physicians holding Army and Navy Commissions in the State as of recent date are as follows: Army—608; National Guard—21; Navy—51. This is slightly below the number of last year.

2. *Legislation.*

During the past year, training for 50 flight surgeons, five from each Corps Area, and five from the Surgeon General's Office has been made possible. This provision is a decided step in the right direction as in the Annual Report of 1938, there were very few Medical Reserve Officers being trained who had completed the required correspondence courses necessary for appointment to a flight surgeon training school. Several schools have been established for such training since the last report.

The War Department has recently announced the appointment of 30 medical reserve officers for commission in the Medical Corps of the regular army as a result of examination held in December, 1939. There is a definite shortage of medical reserves for active duty service and for that reason there should be efforts to enlist the interest of recent graduates of the medical schools to take out commissions.

CCC Medical Reserve Officers serving with CCC units since December 1, 1939, have had a change of status from Reserve Officers to that of a civilian. However, the physician must be recruited from the Medical Reserve Corps so far as pos-

sible. The number of CCC Companies have been reduced, yet Army authorities have had difficulty in supplying the existing units with medical personnel.

There are two bills to be presented at this Congress regarding first, uniform allowances, and second, pay allowance for inactive status training. These bills, especially the latter one, should have the support of all medical societies as under the existing law no provision is made whatever for compensating Medical Reserves who wish to attend Inactive Status Training Units at which military medicine is emphasized. The officers not only sacrifice their practice but incur additional expense and in justice to their patriotic duty the Government could well afford to show its appreciation by contributing an allowance to offset their outlay of expenditures.

3. *War Department Ruling regarding Appointments.* By a recent enactment of the War Department, all appointments have been discontinued except in the Medical Service and Air Corps.

4. *Activities.* The Eleventh Annual Medical Military Inactive Status Training Unit was held in Rochester under the auspices of the Mayo Foundation, from October 8 to 22, 1939. The School was well attended, 269 officers registering from 45 States. The principal instructor of the school was Colonel Kent Nelson, The Surgeon Seventh Corps Area, Omaha, Nebraska. The instructor for the navy was Captain Ernest W. Brown, Medical Officer of the Navy Yard, Brooklyn, New York.

F. L. SMITH, M.D.

REPORT OF THE COMMITTEE ON FRACTURES

A Committee on Fractures of the Minnesota State Medical Association has now been appointed each year for several years and is considered as a necessary committee in our organization. The fracture problem is important for several reasons. Fractures are on the increase and will probably continue so as the speed of our existence increases. With the increase in the number of fractures and the increase in the general knowledge of fractures there is an increase in the public's expectation and demands from our profession in the treatment of fractures. When we recall the teaching in fractures which we received in medical school we have to admit that our knowledge of fractures has for the most part been gained since graduation. In addition there is a continuous improvement in our knowledge of fractures, and inasmuch as fractures occur everywhere and at all times it is important that the State Medical Associations endeavor to meet the demands of the fracture problem through a permanent set-up as the Committee on Fractures.

The Committee on Fractures for 1940 has been greatly enlarged. There has been at least one member appointed from each of the component medical societies of the State Medical Association. It has been the intention to have a local committee on fractures appointed in each of the component medical societies. The members of these local committees are chosen from those who are interested in fractures and who are also willing to work as members of the local fracture committee. Where the component medical society comprises more than one county it is hoped that there will be at least one member representing each county and similarly that there will be a member representing each of the larger communities in the different counties. The chairman of each of the local fracture committees should logically be a member of the state fracture committee.

The work of the State Committee may be divided into two parts. The first part has to do with the annual meeting of the State Medical Association. It may arrange for papers on fractures to be presented by members of the State Medical Association at a symposium on fractures which may be presided over by the chairman of the State Committee. The Committee may arrange for an address on fractures to be presented by a speaker from outside the state. The Committee may also arrange for an exhibit on fractures to be presented at the annual meeting of the State Medical Association, this exhibit to be preferably arranged by the local committee of the county entertaining the state meeting. At this exhibit first aid and transportation methods of handling fractures of the long bones and of the neck and spine should be presented for some years to come. Methods of studying fractures with the x-ray may be presented. Equipment for the treatment of fractures in hospitals particularly and also in offices and homes may be presented. Anatomical problems connected with fractures may be shown. Pathological studies may be presented. Physiotherapy exhibits may well be placed near the fracture exhibit. Methods and results of treatment of special fractures may be exhibited. Individual fracture exhibits may be encouraged and placed next to the committee's exhibit. Also the Committee may arrange a moving picture exhibit on fractures. There is one movie recently purchased by the State Association on "First Aid and Transportation of Fractures of the Long Bones." Another available movie on "First Aid and Transportation of Fractures of the Neck and of the Dorsal and Lumbar Spine" could be advantageously shown. Other movies of fracture subjects are obtainable.

The State Committee on Fractures could hold two committee meetings each year. One meeting should be held early in the year shortly after the Committee is appointed, and the second meeting could be held as a breakfast meeting during the annual meeting of the State Association. At the first meeting the duties of the Committee could be discussed and planned, and at the second meeting, reports of progress and experiences could be presented.

The second part of the work of the State Committee consists of the work of the individual members on the Fracture Committee in each of the component medical societies. Too

often the bad results obtained after the treatment of fractures are the result of several different factors over which the doctor may have no control. The medical profession is often criticized for these bad results and malpractice suits occasionally result.

The local Fracture Committee could arrange an annual meeting of the component society devoted to fractures. The following subjects might be presented at such a meeting:

1. "First Aid and Transportation of Fractures of the Long Bones."
2. "First Aid and Transportation of Fractures of the Spine."
3. "The Diagnosis of Fractures With the X-ray."
4. "The Minimal Equipment for Hospitals Caring for Fractures."
5. "Anatomical Problems Occurring in Certain Fractures."
6. "Pathological Problems Occurring in Fractures at the Time of Injury and in the Process of Healing."
7. "The Treatment of Individual Fractures."
8. "The Treatment of Compound Fractures."

When a patient receives good first aid and good transportation with proper splinting and the doctor has only to treat him for the damage produced at the time of accident he can get a better result in the treatment of the fracture. The local Fracture Committee may obtain from the State Medical Association the 16 mm. movie film demonstrating the application of traction splints for first aid and transportation of fractures of the long bones. Also the State Medical Association will soon have available a movie film demonstrating the handling of fractures of the cervical spine and also of the dorsal and lumbar spine. These movies could not only be shown to the members of the component medical society at the annual fracture meeting, but they could be shown to lay groups such as the Boy Scouts, Girl Scouts, Red Cross groups, policemen and firemen, highway patrolmen, ambulance companies and undertakers who operate ambulances, to first aid groups in industrial organizations and to general groups such as church organizations, lodges and local movie houses. The splints are obtainable from one of the ambulance companies in Minneapolis, and it is advisable to place them in as many places as possible where they may be of service. It is also advisable to place them in local hospitals for exchange when splinted patients are brought in. For this reason the splints should be standardized and inexpensive.

If the doctor is given a patient who has received good first aid and transportation, and if he is also given a proper set of x-rays of the fracture giving him the diagnosis in an understandable manner he can treat the fracture better and get a better result. A set of instructions for the guidance of technicians for the proper x-raying of fractures from a surgical standpoint is available. These instructions tell only the number and direction of the required views, the size of films to be used in order to show a proper amount of the skeleton which may be involved in the different common fractures, when to use the Bucky diaphragm and when to use stereoscopic views in order to give necessary diagnostic assistance from a surgical treatment viewpoint. The local Fracture Committee could endeavor to get such standardized instructions into the hands of x-ray technicians in their respective areas.

When the doctor has a fracture which has been given good first aid and transportation and which has been adequately x-rayed and when he has the necessary equipment with which to treat his fracture in the hospital he is well on the way toward getting better results in his fracture treatment. The local Fracture Committee can study the facilities in the various hospitals in their respective areas and make recommendations as to equipment which should be available. This should include good plaster, equipment for overhead suspension of fractures, for skeletal traction, portable x-ray equipment, inexpensive splints for upper and lower extremities, and a Gatch bed for the reduction of fractures of the spine. Demonstrations in the use of this equipment could be presented at the annual meeting of the component medical society and at hospital staff meetings and other medical meetings.

At the annual fracture meeting of the medical society, different papers on the different types of fractures could be presented by the different members, and also an outside speaker might be obtained as was done at the March meeting of the Hennepin County Medical Society which was devoted to fractures. There are two related subjects which could be profitably presented. A paper on anatomical problems arising in the treatment of fractures might be very valuable. The pathological conditions arising at the time of injury and the pathology of the healing of fractures is a subject which is receiving increased interest and attention.

The fracture problem is one of the most serious that is confronting the medical profession today, and the number of cases will not only not be reduced but will probably be increased so long as the speed of our existence is increasing as it is today.

The treatment of fractures at the present time is largely a postgraduate problem. Annual meetings devoted to fractures in the county medical societies and frank discussions of the problems connected with the treatment of fractures should reduce the number of malpractice cases which are too frequently arising. The bad results which cause malpractice cases are too often the result of factors which were beyond the control of the doctor treating the patient. If the local Fracture Committees could eliminate these factors in their communities they would not only improve the welfare of the people in general, but they could also improve the general status of the medical profession. In that connection Dr. Adams has stated

that active efforts on the part of the local Fracture Committees should furnish one of the best answers to those who would advocate socialized medicine.

The first problem of the State Fracture Committee and of each local fracture committee is to see that every fracture case anywhere in Minnesota gets good first aid and transportation no matter where the accident takes place, that satisfactory diagnostic x-ray pictures are taken and that all hospitals have a minimum standard equipment for the treatment of the more common fractures.

R. C. WEBB, M.D.

REPORT OF THE COMMITTEE ON INDUSTRIAL HEALTH AND OCCUPATIONAL DISEASES

This new Committee was appointed by President B. S. Adams to study the above named fields. Several members of the Committee attended the 2nd Annual meeting of the National Committee of the same name held under the auspices of the American Medical Association at Chicago in January, 1940. Dr. Carl M. Peterson, National Secretary in charge of this work visited the State February 24 and discussed this field with other members of the Committee.

A meeting of the Committee together with Mr. F. Manley Brist, Dr. A. J. Chesley, Dr. R. N. Barr and other interested officials was held in the Saint Paul Hotel March 30. A report of that Committee meeting is appended.

It is felt that the Committee has made a good start, but no definite recommendations can be made without further study. This will be followed through and reported on by the end of the year.

J. LAWRENCE MCLEOD, M.D.

Extract of Minutes

The Committee on Industrial Health and Occupational Diseases meeting, March 30, 1940, St. Paul:

Need for this Committee to study occupational diseases is shown in the large number of lawsuits started in St. Louis County pertaining to silicosis in which doctors have been testifying on opposite sides. As a result, juries do not consider the testimony of the doctors at all. A committee to study the occupational diseases and industrial hygiene of the state would tend to clarify this situation.

It was pointed out that there are 34 different types of conditions in the law of Maryland which the Minnesota law does not cover. Also that ten per cent of lost time in industry was caused by accidents and the balance by illness.

The functions of the Committee were outlined as follows:

1. To study occupational diseases from both the legal and the legislative angles.
2. To stimulate interest of the various industries in the study of practice of industrial hygiene.
3. To try to provide for the proper training of medical men so that they may be ready when they are needed.

Attorney F. Manley Brist pointed out that the Minnesota law does not define compensable occupational diseases, but if a person has a condition that was made worse for the first time through industry, he is entitled to compensation. A state law was passed in 1939 providing for the study of occupational diseases and provided also for the report of accidents by physicians to the State Board of Health.

A study, under the title of "Casual Inspection Survey of Industry" is now being made by the State Board of Health. This study will be made available to committees and other groups for the purposes of investigation and for correction of the condition revealed. The report will not be available for any lawsuit of any kind, or for any court. It is hoped that this study by the State Board of Health will be complete by the first of September.

Most of the diseases that are compensable in the state of Minnesota are rare and uncommon, with the exception of Lead poisoning, Dermatitis, Undulant fever, Ringworm, Tuberculosis and Silicosis are also prevalent in Minnesota. In the course of a discussion on the relation of periodical physical examination to industrial hygiene, it was pointed out that several companies in the mining district, notably International Harvester Co., Pickands-Mather and Butler Brothers—are making physical examinations of their employees at the expense of the company. Each man is examined physically each year and during every third year an x-ray film is made of his chest to guard against Silicosis. It was suggested that the whole subject of compulsive physical examination for employees be approached carefully because of the labor situation and the danger that many men might not be hired, especially men over forty if the laws are drawn too strictly.

Compensation has done more, in the opinion of Dr. B. S. Adams, to prevent accidents than anything else in history.

Dr. A. J. Chesley, Secretary of the State Board of Health, offered to secure a study of the industrial laws in the various states for the use of the Committee; also copies of the Minnesota Occupational disease law. He hoped also to be able to furnish the committee with copies of the history of the compensation laws of Minnesota.

It was agreed that the biggest problem was the proper method of preventing occupational diseases.

It was suggested that the Committee work with the State Board of Health to teach both the employer and the employee how to prevent conditions which lead to accidents and disease in industry. A suggestion was made that every physician in the state should report any occupational disease treated which he felt might have arisen out of industry to the State Board of Health. Thus the State Board of Health could make an intelligent study and appropriate recommendations.

The meeting adjourned.

REPORT OF THE COMMITTEE ON PSYCHOPATHIC PERSONALITIES

The Committee for the Study of Psychopathic Personalities has not had any meetings since its formation for the reason that the Minnesota Bar Association has not yet appointed their committee. It was agreed that when the President of the Bar Association appointed his committee your chairman would be notified and a joint meeting would be held. Your chairman interviewed Assistant Attorney General Mr. Kent Vandenberg on several occasions and Mr. Vandenberg intends to communicate with the President of the Minnesota Bar Association relative to the appointment of a committee to work with your committee on the question of psychopathic personalities.

At that time some of the controversial aspects of the psychopathic personality laws which now exist will be discussed and possible remedies formulated.

GORDON R. KAMMAN, M.D.

DR. A. E. CARDLE: The Committee has reviewed the reports included under this heading and wishes to report the following:

Committee on Interprofessional Relations: This is an important function of our State Medical Association inasmuch as it serves to bring in closer harmony the Hospital Association, Pharmaceutical Association, Dental Association, Nurses and Medical Auxiliary. They have considered the problems which are directly related and it is hoped that this Committee will persist in their efforts to bring these groups in closer harmony with one another.

Historical Committee: It was the consensus of the Reference Committee that this is an extremely important part of the activities of the State Association. It is our recommendation that the interest which has already been shown be continued and, if the members of the State Association have any material on hand which would be of interest to this Committee that they send it to the Committee. The work that they have done appeared to be more or less restricted to certain interested members in certain localities and it is hoped that at some future time a definite organization may be set up which may start a history of medicine in Minnesota as a whole.

Committee on Military Affairs: The report of this Committee shows that in Minnesota there is a total of 608 commissions in the army, 21 commissions in the National Guard, and 51 commissions in the navy. Since legislation is being considered from time to time in regard to military matters, we wish to recommend to the Committee that they keep in active touch with such legislation and activity which may be of value and interest to the State Association.

Committee on Fractures: The Reference Committee wishes to give this report special commendation. It shows the result of marked activity on the part of the Chairman, Dr. R. C. Webb, and members of the Committee. We wish to recommend that this report be read by all the members of the Association, and as a medium of doing it, we would suggest that this report be published in detail in MINNESOTA MEDICINE. Also we would like to suggest that this report serve as an example of what various committees might do.

We regret that there has been no report from the Committee on Asphyxia and Asphyxial Deaths. More and more interest is being shown in this matter in various states and localities, and it is to be hoped that Minnesota will progress with the times and will realize the importance of these diseases.

Committee on Industrial Health and Occupational Diseases: Dr. Horace Newhart, who is Chairman of the Committee on Conservation of Hearing, visited the Reference Committee in person and wishes to recommend that they consider the importance of hearing in industry. Industry and the medical profession have been slow to accept any specific method of testing for hearing and much disability has resulted. Other

states are showing great activity in this matter, and Minnesota must keep pace. We hope that this Committee will consider this point and so do something along these lines.

The Report of the Committee on Psychopathic Personalities: The Committee is working closely with the Bar Association and awaiting such time as it can meet with the association and review some of the controversial aspects of the Psychopathic laws which now exist. We hope this Committee will continue this activity.

The Reference Committee wishes to thank the various chairmen and their committees for their interest and work during the past year.

It was moved, seconded and carried that the report of the Reference Committee on Miscellaneous Scientific reports be accepted.

Dr. W. W. Will then asked for the report of the Reference Committee on the reports of the Officers and Council. The following reports were reviewed:

REPORT OF THE SECRETARY AND EXECUTIVE SECRETARY

The Minnesota State Medical Association has made definite progress in many directions during 1939 and 1940.

Membership has increased substantially this year with the total of 2,449 on April 4, 1940, as compared with 2,323 on the same date last year, and dues have reached the State Office more promptly this year than last, thanks to the assistance and fine cooperation of secretaries all over the state. The early date of the 1940 meeting and the fact that the roster was published, as a consequence, a month earlier than usual made this cooperation on the part of county society officers especially welcome and greatly appreciated by the State Office staff.

Finances

The finances of the association will be reported in detail by the treasurer but it is surely worthy of note, here, also, that the end of 1939 found us with a substantial surplus in spite of the fact that it was necessary to pay the Social Security taxes covering the entire period since passage of the Social Security law, this year. The care exercised by all Committees to live within their budgets has contributed greatly to this achievement.

Annual Meeting

It may be of interest to point out, also, in this connection that last year's meeting, held in Minneapolis, paid for itself with a net profit after all expenses, not only of the scientific sessions, but of the public health exposition had been paid. It was unnecessary, therefore, to use any of the money which has always been set aside out of the general funds for that purpose. Accounts have not yet been fully settled for the Rochester meeting, but the probability is that a profit will accrue to the association from this meeting also. Attention of all the members should be called to the fine technical exhibit section which presents many new exhibitors this year and which makes possible these fine meetings at no expense to the association. Members are urged to investigate all exhibits and discuss the products displayed with firm representatives.

Social Security Status

A word of explanation about the status of the association in relation to the Social Security taxes might be of interest here. The Minnesota State Medical Association, together with most of the state medical associations of the country and the American Medical Association, has been held liable for Social Security taxes on the ground that, although it is undoubtedly an educational institution, it cannot be called a non-profit institution because membership yields a definite and demonstrable benefit to its members. Since it has been held liable for the Federal Social Security tax, it is also liable for state Social Security taxes, including the unemployment insurance tax. The taxes have been paid under protest pending final disposition of an appeal to change the ruling.

Increase in Office Space

In connection with this discussion of association finances, something should be said, also, about the increase in office space which was approved by the Council at the beginning of the year. An additional office unit has been acquired and alterations have been made to provide a new and enlarged committee room, enlarged files, work space, and store room. The enlarged storage space has permitted us to purchase office supplies in large enough quantities and at sufficient savings to cover the increase in rental.

The increased work space and filing facilities were necessitated by the expanded program which was undertaken at the direction of the Council this year. Details of this program are given in reports of the various committee chairmen. It is reviewed here, briefly, in order to give a general picture of the scope of our work in Minnesota.

Coördinated Program

The Coördinated Medical and Public Health Program got off to an auspicious start last year and is now a major part of our regular activities. Between 300 and 500 packets are now sent out on request each month, and requests for speakers on the subject of the month are more and more numerous. Many of the latter are filled from the State Office through the Speakers' Bureau. Many others are made direct to members throughout the state. In addition, the regular weekly news releases of the association have been directed exclusively to the subject of the month and the radio broadcasts by the association's radio speaker, Dr. W. A. O'Brien, have been largely directed to the same subject.

In connection with the radio broadcasts, an experiment is now underway by which copies of Dr. O'Brien's talks may be made available eventually to any one who wishes to send 10 cents to cover mimeographing and mailing. If the experiment should prove to be successful, this service will be added to the regular program of the association.

Thus education on these subjects is reaching to the far corners of the state and to a large number of people. Even more important, in the opinion of many observers, the packet provides a very practical and important aid to the postgraduate work of the association. The effort of the committee in charge to provide in each packet some new and important scientific information, much of which is not yet available in the literature, is especially noteworthy. Also the fine statistical studies provided by the Minnesota State Department of Health have brought a service which was never before available in this form to our members.

A large number of requests for packets and information about the program have come from representatives of the United States Public Health Service in Washington and from other large foundations and institutions who are interested in health and postgraduate education. Many have offered pertinent suggestions and constructive aid.

Speakers' Bureau

Expansion of the Speakers' Bureau has followed inevitably upon the development of the subject-of-the-month program. Many new speakers have been added to our list of qualified lecturers and much additional material has been added to our speakers' library. Included in this new equipment is a new 16 millimeter motion picture projector and screen and a stereopticon. New motion picture films are being added to the library also, notably a film on first aid in the handling of fractures of the long bones. This new aid to speakers will be expanded.

College Lectures

The College Lecture Course, which continues each year as a Speakers' Bureau activity, has been highly successful this year judged by the enthusiasm displayed by college authorities who reported to the State Office at our request on the lectures and their reception. Two lectures are offered each college during the year and a choice of eight subjects with four lecturers for each subject. As far as possible, each college picks its own lecturer as well as subject. All bookings and other arrangements are carried on by the State Office staff as part of the regular office routine. It is of interest to note that by far the most popular subject offered this year was "Mental Hygiene for College Students" though all of the subjects were selected by one or more colleges.

Talks on Government Medicine

Other requests made through the state office for speakers reflected the overwhelming interest of women's groups, luncheon clubs, and others in the general subject of Government Medicine and the National Health Program in particular. Securing speakers and material for speakers on this subject alone meant a substantial addition to the work carried on in the office. A special packet of material from various sources was gathered for this purpose and is being constantly added to and brought up to date.

The most recent addition to our Minnesota material on the subject was prepared in the office at the request of the State Federation of Women's Clubs in the form of a brief which should present the attitude of physicians and public health officials of Minnesota toward the proposals of the Wagner Health Bill of 1939. It was designed as an answer to another brief urging the necessity of the Wagner Health Bill and the National Health program which is being distributed through the League of Women Voters to the women of Minnesota.

News Service

The regular newspaper health service of the association which has long taken the form of a short weekly news release issued to country newspapers, through the Minnesota Editorial Association, by the Committee on Public Health Education, is about to be converted into a Question and Answer Service for the same newspapers. This change is being made in response to the request of many individual newspapers and of the committee of the editorial association appointed to keep a contact with our association. The development of the new service will entail considerable additional work in preparing copy and authoritative answers to readers' questions.

Radio

The radio program, long confined to the weekly broadcasts over WCCO will be expanded shortly to provide for a different type of program, possibly of the round table type over KSTP and its affiliated Minnesota stations. Details of the new program have not yet been fully worked out, but a promise of

time for the purpose has been secured from station officials. In the meantime, it is gratifying to note that Dr. O'Brien's broadcasts are now carried also by WLB and KDAL, Duluth.

Medical Service for Welfare Clients

An important part of the work of the State Office and the executive secretary has been, for many years, the close contact maintained with state and government agencies of all sorts, so many of which are now concerned in some manner with the delivery of medical care.

It is interesting and very encouraging to note the important rôle now being assumed by our committees in this work and in the actual functioning of many public welfare programs.

The handling of medical care for relief clients and for recipients of the social security aids is now, to an important degree, in the hands of our own committees and representatives.

The handling of all medical problems connected with public welfare has undergone re-organization with the establishment of the new Department of Social Security under which the Division of Social Welfare, directed by Mr. Walter Finke, now correlates all categories of relief and aid.

New Status for Committees

As a direct result of Mr. Finke's expressed determination to seek the aid of physicians in all matters relating to medical care, a medical advisory committee was appointed from among nominees made by the Council. This committee now meets regularly as an adjunct to the State Division and works out all regulations with Mr. Finke. Similarly, the county contact committees, established some years ago to assist in the handling of local relief problems, have been revived and given an official status as advisory committees to each County Welfare Board. The boards have been urged by the State Division to use these local advisory committees as closely as Mr. Finke and his aids now use the state committee.

Out of this new approach should develop a better plan and better working cooperation between physicians and welfare officials than ever before existed in Minnesota. It is noteworthy that as much is expected in the way of understanding and cooperation from the physicians as from the officials who carry responsibility for authorizing funds. The willingness of physicians to cooperate in these matters has long been in evidence in Minnesota.

The principle of free choice of physician for which this association has always stood has been challenged in several quarters this year. The handling of this matter has taken a great deal of the time of our attorney, Mr. F. Manley Brist, who has spent many hours with the State Office and in the courts defending the principle as it operates in Workmen's Compensation Insurance, in contract practice, and in medical care for relief patients. Pressure is being brought to bear, of course, by a number of organized groups to do away with free choice as it applies to several types of patients. The importance of this matter to everyone in the practice of medicine is obvious.

Farm Security Plan Rejected

No cooperative plans for medical care of Farm Security Administration clients have been inaugurated as yet in Minnesota. With the consent of the Committee on Low Income and Indigent Problems which has had the government proposals under consideration for some time, one county society gave the matter considerable study, however. Administration representatives urged adoption of a plan in the county in question but eventually the members voted against it. Nowhere in Minnesota was any need demonstrated that would justify experiment of this sort. The collapse of Dakota plans and the dissatisfaction with the working of similar plans elsewhere has entirely justified this attitude.

Malpractice Insurance

Under the direction of the Medical Advisory Committee, the executive secretary has continued to assist in the investigation of the malpractice situation in Minnesota. Complaints have been quite general during the last few months concerning certain additional premiums for malpractice insurance that are being asked by one company and concerning changes in coverage announced by another. The complaints have promoted the Council to order a thorough study of all malpractice policies offered physicians in Minnesota by Mr. Brist. Mr. Brist will report on this study to the delegates at this session, and the delegates, it is hoped, will adopt some definite recommendation on the basis of it.

New demands are made constantly on the resources of the State Office and on the time of the secretary and staff. These demands could not be met without the most generous cooperation and assistance from all of our committees and officers and from our county and district secretaries. They could not have been met, either, without the loyal cooperation of the members of our office staff all of whom have taken a personal interest in seeing that the work of the association is carried on.

We do not know what new developments in Washington may bring us in the way of national legislation or of altered relations between physicians and the government. We do know that in Minnesota the doctor is still a trusted public servant, a leader in his community, a professional man whose word is still heeded where the welfare of the public is concerned.

There seems to be no reason why this fortunate status should change provided we continue as individual physicians and as an association to assume our share of the responsibility for the health and welfare of the people of Minnesota.

B. B. SOUSTER, M.D., Secretary
R. R. ROSELL, Executive Secretary

PROCEEDINGS EIGHTY-SEVENTH ANNUAL SESSION

REPORT OF THE TREASURER

The attached statement of cash receipts and disbursements for the year which ended December 31, 1939, was made by Shannon and Byers, Certified Public Accountants, who finished auditing the books of the association, February 24, 1940, and found them to be correct in all respects.

It will be noted from this statement that the finances of the association continue in excellent condition.

The year 1939 was a legislative year, and in spite of the heavy extra expense always incurred during a legislative year, there was a surplus on December 31 of \$5,038.34.

Special mention should be made of the fact, also, that the Herman M. Johnson Memorial Fund is not included in the above mentioned surplus. This fund of \$2,000 plus the accrued interest is held in a separate account under the special jurisdiction of the Council.

Delegates and members are urged to study this statement carefully for a better understanding of the administration of association affairs.

W. H. CONDIT, M.D.

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1939

CURRENT FUNDS	
CASH ON HAND, DECEMBER 31, 1938:	
American National Bank, checking account	\$ 3,692.97
American National Bank, savings account	26.28
American National Bank, Exhibit checking account	493.87
American National Bank, Exhibit savings account	2,264.78
Farmers & Mechanics Bank, savings account	5,075.32
First National Bank, savings account ..	64.93
	\$11,618.15
CASH RECEIPTS, YEAR 1939:	
Dues collected:	
For year 1938 and prior ..	\$ 105.50
For year 1939	32,703.00
For year 1940	4,605.00
	\$37,413.50
Technical exhibit rentals collected:	
For year 1939	\$ 5,298.50
For year 1940	2,807.50
	8,106.00
Annual meeting, luncheons ..	566.75
Annual meeting other	398.97
	965.72
Publishing Co. (Bruce) (Minn. Med.) ..	934.76
Interest on Savings Accounts	159.15
Telephone Co. refund	145.04
Postage refunds	106.79
Salary advances repaid	75.00
Public Policy Committee	69.32
Public Health Education Committee ..	38.00
Diabetes Booklet sales	85.97
Hospital & Medical Ed. Committee ..	16.50
Office supplies refunds	55.73
Sundry items	5.00
Total receipts	48,176.48
	\$59,794.63
CASH DISBURSEMENTS, YEAR 1939:	
Special committees:	
Historical	\$ 4.10
Hospital & Med. Education	42.00
Medical Economics	521.88
Public Health Education	2,952.56
Public Policy	9,072.92
Radio	405.00
Unbudgeted	297.90
Conferences and Meetings:	
Technical Exhibit & Annual Meeting ..	7,695.31
A. M. A. Delegates	141.70
Council	344.78
County officers' meeting	403.36
	\$21,881.51
	\$59,794.63
President's contingent fund	102.64
Membership expense	233.47
Office equipment	973.79
Minnesota Medicine	4,834.50
Dues refunds	38.00
Diabetes booklets	3.14
Transfer to permanent investment ..	4,000.00
Administrative:	
Executive Secy's salary	4,500.00
Executive Secy's expenses	1,281.70
Office salaries	5,085.00
Office supplies	598.73
Postage	506.79
Telephone and telegraph	346.00
Miscellaneous expense	230.42
Audit and insurance	287.73
Periodicals	82.17
Office rent	960.00

Social Security Taxes	1,981.35
Secretary's salary	100.00
Secretary's expenses	138.12
Treasurer's salary	100.00
Total disbursements	48,265.06

CASH ON HAND, DECEMBER 31, 1939:	
American National Bank, checking acct. ..	\$ 2,358.58
American National Bank, savings acct. ..	18.89
American National Bank, exh. chkg. acct. ..	2,646.50
American National Bank, exch. savings acct.	1,290.35
Farmers & Mechanics Bank, savings acct.	5,177.59
First National Bank, savings acct.	37.66
	\$11,529.57

REPORT OF CHAIRMAN OF THE COUNCIL

At the time of the annual meeting of 1939, four sessions of the Council were held. The important features of two of these were reported to the House of Delegates. However, it may be of interest to review some of the actions taken at the meetings of June 1 and 2 which were not reported. These meetings were held chiefly in connection with the State Board of Health and finally led to the approval of the suggestions of the State Board of Health in connection with the following points: (1) That free drugs for the treatment of venereal diseases be supplied only to those who are financially unable to pay for them. (2) That standardization of the laboratories of the state did not seem to be necessary at the present time although it was regarded that standardization should be an optional matter in the future with the assistance of the laboratory of the State Board of Health. (3) That no venereal disease clinics need be established in Minnesota at the present time. (4) That the policy of treating venereal disease in the private office of any duly licensed practitioner be approved.

Close cooperation between the Minnesota Public Health Association and the Public Health Education Committee of the State Association was urged with expenditure of necessary funds by the Chairman of the Public Health Education Committee on the approval of the Chairman of the Council.

During the year meetings were held September 3, 1939, November 26, 1939, and February 23, 1940. The meeting of September 3 was again held chiefly in connection with the members of the State Board of Health. It was pointed out by Dr. Chesley that under H. R. 6635 an amendment to the Social Security Act, an additional appropriation of approximately \$10,000 would be allotted to Minnesota for the fiscal year of 1940 and the wise expenditure of funds was the chief topic of consideration with special reference to pneumonia, cancer, malaria, industrial hygiene, dental hygiene and tuberculosis.

It was stated that there had been some desire on the part of the Federal Administration to place the activities in industrial hygiene under the Department of Labor rather than the Public Health Service. This has been opposed by the State Boards of Health, the American Medical Association and the American Public Health Association. There has also been pressure from the Federal Administration to provide specifically for medical care for maternity cases and children in selected areas. Dr. Chesley, as you know, opposes any extension of medical treatment by State Boards of Health. Activities and expenditures in connection with the various diseases mentioned were considered in detail and the utmost cooperation between the State Board of Health and the Council was evident.

The urgent necessity for vaccination and immunization campaigns, especially in rural districts, was discussed and referred to a committee for definite action.

The College Lecture Course for 1939 and 1940 was approved. The report of the Committee on Industrial Relations in connection with the situation in St. Paul was accepted and the Council reaffirmed its former stand in favor of free choice of physician in compensation cases. This report of the Committee on Industrial Relations gave in detail the activities of the St. Paul City Council in connection with the so-called "five doctor panel plan" for the treating of all city employees and explained the opposition of the Ramsey County Medical Society and the St. Paul Trades and Labor Assembly to this panel. The filing of a brief on the case by the State Medical Association "as a friend of the court" if it should be necessary was approved by the Council. Dr. Adson explained the case of the Eagles Fraternal Order of Austin versus the Mower County Medical Society (for comments on this see the report of the Councilor of the First District). This case, involving the question of the practice of medicine by the Eagles Lodge, is of such importance as a precedent that the Council voted financial assistance to the Mower County Medical Society if it should be necessary in the event that the case be carried to the State Supreme Court or the United States Supreme Court. So far the expense has been assumed by the Mower County Medical Society.

It was decided to approve of a Pilgrimage and Memorial Service in honor of Dr. W. J. Mayo and Dr. C. H. Mayo, to be held October 27 in conjunction with a meeting of the Alumni Association of the Mayo Foundation. This was later carried out as planned and proved to be a very effective ceremony.

The Distinguished Service Medal of the Association and Citations were awarded to Dr. W. J. Mayo and Dr. C. H. Mayo and Dr. H. M. Johnson. These were presented at the time of the Fiftieth Anniversary of the founding of the Medical School.

PROCEEDINGS EIGHTY-SEVENTH ANNUAL SESSION

At the meeting of November 26, 1939, the finances of the Association were given special consideration. Two budgets for 1940 were presented, one based on the present program and the other on an enlarged program of activities. The program calling for increased activities was adopted in view of the surplus of 1938 and the apparent surplus of 1939. It will be remembered that at the end of 1938 \$4,000 was transferred to the permanent investment fund of the Association and it seemed wise to increase the activities of the Association rather than to place so large a portion of the surplus into a permanent investment account. This enlarged program necessitated additional office space which has now been supplied and I am sure the offices of the Association are worthy of a visit by every member. They are offices of which we can be proud. Other increased activities are in connection with the speaker's library, the purchase of lantern slides, and possibly motion picture films, the President's monthly packet, and educational program, necessary office equipment and an increased budget for the Public Health Education Committee. With the increased office space for storage it will apparently be possible to save by purchasing materials in larger quantities an amount equal to the additional rent. As a result of the enlarged program of activities and the additional cost of the legislative year, it will be found that the surplus for 1939 is not as large as for 1938. The technical exhibit is now more than carrying the entire cost of the annual meeting.

Mr. Walter Finke, of the State Division of Welfare, outlined the general policy of his Division. This was approved and the Council expressed its appreciation to Dr. Hilleboe and Mr. Finke for the cooperation shown by them in meeting relief problems.

Dr. Chesley submitted a plan for obstetrical teaching, demonstration and home delivery service which will be in charge of Dr. McKelvey of the University of Minnesota as a proper expenditure of Federal Funds.

Council Committees and the President's Committees for 1940 were approved. The following members were named to the Finance Committee of the Council: E. M. Jones, C. A. Stewart and H. Z. Giffin. President Elect, Dr. Adams, was given authorization to appoint two new committees, one on Industrial Hygiene and Occupational Diseases, with J. L. McLeod as Chairman, and the other on Vaccination and Immunization, with L. R. Critchfield as Chairman. E. L. Tuohy was named as Chairman of the Public Health Education Committee. The following names were suggested as an Advisory Committee to the State Division of Social Welfare: A. W. Adson, W. A. Coventry, E. J. Simons, C. A. Stewart and L. L. Sogge.

At the meeting of February 23, 1940, the following general topics were considered: (1) The organization of a Society for Research in Convulsive Disorders, as outlined by D. E. McBroom. (2) The continued laxity of certain physicians in filling out and filing birth and death certificates. (3) The drafting of a bill by the Minnesota Hospital Service Association. (4) The licensing of Rest Homes. (5) The advertising of oleomargarine in medical journals. (6) Advertising in connection with the opening of new hospitals. (7) The variations in policies of insurance companies for malpractice insurance and the question of fees for testimony in malpractice cases. (8) The purchase of pure grain alcohol for office and scientific use.

These are some of the topics which have been considered and the most important actions taken by the Council during the year. Detailed minutes are open for inspection by any of the Delegates or other members.

May I take this opportunity to express my appreciation of the fraternity, loyalty, honesty, tolerance, fairness and good judgment of the members of the Council and the officers of the Association and to commend the efficiency and ability of the Executive Secretary and the Administrative Staff.

H. Z. GIFFIN, M. D.

REPORT OF THE COUNCILOR OF THE FIRST DISTRICT

The Societies of the First District have been more active than ever before and have handled their own problems effectively. This is as it should be.

The most important problem of the year has been the situation created by the practice of medicine by the Eagles Lodge at Austin in which instance the lodge hired a physician and an osteopath to care for illnesses among members; but even this situation is being handled by the local Society in association with the State Board of Medical Examiners. Your councilor was requested to attend a meeting of the Mower County Society to which were also invited our Secretary, Executive Secretary, representatives of the State Board of Medical Examiners and legal advisors. The decision of this meeting led to the entering of a restraining order against the Eagles Lodge by the court and in counter-action the lodge has appealed to the State Supreme Court. Because of the importance of the final decision in this case both for the medical profession and the public in Minnesota and in fact from the national standpoint, as a precedent, the local society requested the financial assistance, if it should be necessary, of the State Association and possibly even of the American Medical Association. So far the expense has been met by the local society. This matter was brought before the Council of the State Association by your Councilor and the Council favored giving the Mower County Society every assistance that might be necessary. The case is still pending.

There has been, as is well known, some lack of cooperation

in certain counties between the Public Welfare Boards and our Contact Committees. In view of the new and very reasonable regulations of the present Director of the State Division of Public Welfare concerning the handling of medical relief, it is to be hoped and expected that Contact Committees will establish and maintain from now on the utmost cooperation with County Welfare Boards.

The President's program for focusing discussions each month on one or two general topics and the monthly packets on these subjects have been most favorably received. I know of no other problems which the Societies of this District desire to have referred to the House of Delegates either for their action or for their information.

H. Z. GIFFIN, M. D.

REPORT OF THE COUNCILOR OF THE SECOND DISTRICT

The Societies in the Second District have been very active during the past year. They are making good use of all postgraduate opportunities as shown by large attendance at all courses. Their own scientific programs have also maintained a high standard.

There are medical clubs in most of the counties and these clubs handle all medical programs in their own communities. Most of them, for instance, have put on county vaccination and immunization programs though the men who are doing obstetrical work are also making a special effort to instruct their patients in the value of looking after both vaccination and immunization in the first year of life. We believe that this is the ideal way to promote preventive measures.

The men of the second district are quite sympathetic, I believe, to the policies of the Minnesota State Medical Association.

L. L. SOGGE, M.D.

REPORT OF THE COUNCILOR OF THE THIRD DISTRICT

As Councilor of the Third Councilor District of the Minnesota State Medical Association, it is my pleasure to make the following report:

There has been an increase in the membership in each one of the component County Societies during the last year. Programs as given at the various meetings have been of high class, and unusually well attended showing a continuance of the marked and increasing interest along both medical and economic lines as they affect the professions of Western Minnesota.

I bespeak a further increase in membership during this next year as we are fortunate in having a large number of younger men who are taking up the practice of medicine in my district. The care of those who come under various parts of the Social Security Program, as well as Hospitalization of these same classes of people, is still of paramount importance, and it is the hope of the Councilor of this District that a program of settled nature may be worked out in the very near future.

B. J. BRANTON, M.D.

REPORT OF THE COUNCILOR OF THE FOURTH DISTRICT

The affairs in the Fourth Councilor District, since the present Councilor has taken office on the first of January, have run smoothly. Doctor Holbrook, the retiring Councilor from our District, who was in office to the first of the year, reports also that everything has been in good condition here.

A. E. SHMER, M.D.

REPORT OF THE COUNCILOR OF THE FIFTH DISTRICT

I herewith submit my report as councilor of the Fifth District:

In my report of April 27, 1939, I mentioned the fact that Dr. F. E. Mork and Dr. B. W. Bunker of Anoka, Minnesota, had had some difficulty in obtaining a membership in the East Central Medical Society. I am very glad to report that these men have since been admitted to membership in the East Central Medical Society.

In September, 1939, I received a letter from Dr. Fredlund of Milaca, Minnesota, in which he complained about newspaper notices that were being inserted by Dr. C. J. Henry, who is a member of the Stearns-Benton County Medical Society. I took this matter up with Dr. J. N. Libert of Saint Cloud, who is secretary of this Society, and he called Dr. Henry for a conference. The matter apparently has been satisfactorily adjudicated.

I attended the meeting of the Washington County Medical Society February 13, 1940, at which time there was a discussion of several problems regarding various memberships in the society. A number of plans were discussed, and I believe satisfactory solutions were reached in each case.

At the request of the Council of Medical Education and Hospitals of the A.M.A. I investigated the Cherokee Sanitarium of St. Paul, Minnesota, and the Community Hospital at Farmington, Minnesota. These institutions had made application for recognition in the next hospital number of the American Medical Association Journal and the new American Medical Association Directory. I recommended the Community Hospital at Farmington for such recognition.

Several attempts have been made to have a meeting called in order that Mr. Rosell, Dr. Souster and myself could meet with the members of the Dakota County Medical Society. So far, we have been unsuccessful, and apparently it will be very difficult to again have this Society functioning as a unit. As many of the members in this county belong to the Ramsey County Medical Society, there is a lack of interest in rebuilding the Dakota County Medical Society. It has been felt that the other men could continue their medical affiliations by transferring to nearby societies.

This matter was proposed to the Washington County Medical Society, and they were very willing to take in men that live in Hastings who belong to the Dakota County Society. It would seem that this is the best solution to the problem.

E. M. JONES, M.D.

REPORT OF THE COUNCILOR OF THE SIXTH DISTRICT

During the past year the membership of the Hennepin County Medical Society has increased from 622 to 641. The licensed physicians living in Hennepin county who are not members of the Society include some of the full time professors at the University, resident physicians, interns and physicians in government service at Fort Snelling. Practically all physicians engaged in private practice who are eligible are members of the Society. The same is true of the physicians of Wright County.

During the year representatives of the Federal Farm Rehabilitation Bureau conferred with the Wright County Medical Society relative to providing medical care to farm relief clients on the basis of loans made by the Federal Government to these clients. After considerable study it was decided that the number of relief families in this category was too small to warrant this special venture into the field of federal subsidy for medical care.

Recently the Federated Women's Clubs and the League of Women Voters have manifested a genuine interest in the Wagner Bill and Socialized Medicine. Through meetings with officers of these organizations the defects of the Wagner Bill, the disadvantages of socialized medicine, the platform adopted by the American Medical Association, and the fact that medical care is now available to the poor, as well as to the financially independent, have been explained in detail. It is our opinion that the representatives of these organizations now understand the viewpoint of the Medical Association, appreciate its soundness and reasonableness and are in sympathy with it.

Occasionally the physicians in Rural Hennepin County find themselves disagreeing with the County Commissioners relative to compensation for services rendered to relief clients. These difficulties probably can be solved satisfactorily by providing a Medical Advisory Committee to which problems of this nature can be referred. This recommendation is transmitted to the Executive Committee of the Hennepin County Medical Society.

The tuberculin testing project sponsored by the Hennepin County Medical Society has resulted in reports of an excess of 7,000 tuberculin tests applied in the private offices of our members.

C. A. STEWART, M.D.

REPORT OF THE COUNCILOR OF THE SEVENTH DISTRICT

Membership in the two component medical societies in this district is slightly higher than at the same date a year ago. A recent review of membership in the district made by Mr. Rosell, Executive Secretary, showed that no desirable physician in the territory of the Stearns-Benton County Society was not either a member or an applicant for membership. Very few reputable physicians in its territory were not members of the Upper Mississippi Medical Society.

Extension of the activities of the Minnesota Hospital Service Association into this district has occurred this year in the St. Cloud and Wadena territory. Danger of discrimination, and encroachment on the privilege of free choice of hospitals, and consequently, physicians, was avoided by joint action of the officers of the Association, physicians and hospital administrators. Before promotional work was started, efforts were made to extend membership in the Association to all hospitals in competitive territory. Qualification for such membership is facilitated in the interim between regular meetings of the component medical society by the appointment of a Hospital Committee empowered to approve or reject hospitals, should such action be necessary to safeguard the interests of either hospitals or physicians.

As an outgrowth of a problem raised in the Todd County Medical Club, both component medical societies and later the Park Region Medical Society and the Red River Valley Medical Society of the Eighth Councilor District adopted minimum medical fee schedules and sanctioned a uniform 25 per cent reduction of these schedules for medical services for the indigent sick. This action was necessary to avoid giving 40 per cent reduction to one township or county and 25 per cent reduction to another separated only by an imaginary line. During discussions of the matter, opinions were expressed that both a uniform minimum medical fee schedule and a uniform reduction of such fees for medical services for the indigent sick should be obtained throughout Minnesota with the possible exceptions of Minneapolis, St. Paul, Duluth and Rochester.

EDWIN J. SIMONS, M.D.

REPORT OF THE COUNCILOR OF THE EIGHTH DISTRICT

There is little to report from the Eighth District aside from the usual high type of practice and medical meetings, except that some progress has been made in the handling of the depressing problem of medical and hospital care for the indigent and low income groups.

As a trial area for hospital insurance, outside the larger cities, Fergus Falls was selected as the point of entry into the Eighth District. The Minnesota Hospital Service Association canvassed the city with good success. After a few months' operation, it appeared to offer much for the groups which have been reached, establishing for them the desirable principle of "pay before you go." Those who have required hospital care are much pleased and those who have not seem satisfied with the security assured.

1. As yet, the problem of groups in the rural areas has not been solved. Much interest has been aroused among the creamery patrons. It is hoped soon that a sufficient per cent, can be interested so that the fees can be deducted from the cream checks. When this comes about, the hospital insurance in the rural areas will be on a firm financial basis.

2. Indigent. Here there continue to be great difficulties and many misunderstandings. Mr. Finke is doing all that he can to clear the way by impressing upon all Welfare Officers their legal obligation to provide medical care of the indigent and the right of indigents to free choice of physician. The great variation in doctors' fees is still the source of much trouble. We are, therefore, in the Eighth District, making an effort to standardize them.

3. The low income group continues to be the chief sufferer here as everywhere. It is likely that those just above indigency should have, at least, the same discounts as indigents.

W. L. BURNAP, M.D.

REPORT OF THE COUNCILOR OF THE NINTH DISTRICT

A review of the accomplishments of medical organization, professional and public relations of the Ninth District during the past year evidences a continued and improved interest by its membership. Proceedings of the St. Louis County Medical Society and its branch, the Range Medical Society, are regularly devoted to organization and medical economics questions and the high percentage of attendance and the work of the various committees is an expression of recognition of the ideals and purposes of our state organization.

Surveys throughout the year show that membership completely covers all available and acceptable physicians.

The society receives with accord the program presented by the Director of Welfare of the state and hopes this may improve our relations with the local responsible relief authorities. Expenditures of large funds for new hospitalization and a proposed revision of the method of handling medical relief are of immediate importance for disposition. We are assured consideration from the above source will be obtained.

The representation at the county officers meeting was in good number and subjects were reviewed by each individual at the following meeting.

The Interprofessional Relations Committee had occasion to meet with all local District Judges recently and an early meeting with a group from the Bar Association is contemplated. This program will be enlarged.

After considerable time, the extension of the weekly program of Dr. O'Brien to one of our local stations has been consummated and there is hope that there will be no interference with its continuance.

This district anticipates with interest the coming meeting in Rochester and expresses to the officers of the state association its appreciation for the cooperation and assistance during the past year. To Mr. Brist, we also extend our thanks.

F. J. ELIAS, M.D.

Dr. S. A. SLATER (acting Chairman): We have nothing but praise and few recommendations for the reports of the Officers and Councilors.

We have carefully examined the reports assigned to you and wish to submit the following recommendations:

1. *Report of the Secretary and Executive Secretary:* We wish to compliment them and express our appreciation of their work. We wish to especially recommend that the Speakers' Bureau, College Lectures, and Talks on Government Medicine be continued, and, if it is felt justified, enlarged. We approve the action of the Officers in making available Dr. O'Brien's talks, and wish to compliment them on the fact that the radio program has been enlarged. We recommend that the report of the Secretary and Executive Secretary be approved by the House of Delegates.

2. *Report of the Treasurer:* It is highly gratifying to learn that there has been a satisfactory surplus after the achievements have been attained by the Officers, Council, and Executive Secretary. We wish to recommend the approval of this report.

3. *Report of the Chairman and Members of the Council:* Your Committee notes the excellent condition throughout the various districts. We wish to call attention to the fine relationship they have been able to maintain with the State Board of Health and appreciate the cooperation that Dr. Chesley and his Department has given us.

DR. D. P. HEAD: This is a very very pleasing treasurer's report, and I wish to compliment the treasurer, but there is one thing that I think we should have as a matter of policy. We should have the previous year's figures listed beside the present year's in the report, in order to evaluate the present trend of our financial expenditures. I should like to make a motion in the House that the Treasurer be instructed to do so.

It was moved, seconded and carried that the future reports should be made in accordance with Dr. Head's suggestion to the Delegates.

It was then moved, seconded and carried that the report of the Reference Committee be accepted.

Dr. W. W. Will then called for the report of the Reference Committee on State Health Relations reports. The following committee reports were reviewed:

REPORT OF THE COMMITTEE ON STATE HEALTH RELATIONS

The usual assortment of minor problems was referred to the Committee on State Health Relations during the year. The committee kept in touch with the State Board of Health and had a representative at practically every meeting of that Board.

On instructions from the Council we have offered our assistance to the State Civil Service Board for the drawing up of examination blanks for applicants for medical positions under the State. Our assistance has not yet been requested.

The committee has arranged to meet two weeks before each meeting of the Council on notification from the Executive Secretary, to hear reports from the members and to report to the Council.

T. H. SWEETSER, M.D.

REPORT OF THE COMMITTEE ON PUBLIC POLICY

No legislative session has intervened since the last meeting of the House of Delegates. Several matters which involved the legislative policy of the association have been referred to the committee, however, and I shall be glad to make a verbal statement on the committee's activities with regard to them to the Reference Committee and, if called for, to the Delegates.

L. L. SOGGE, M.D.

REPORT OF THE COMMITTEE ON UNIVERSITY RELATIONS

At the Secretaries' Meeting held in February, Mr. Ray Amberg, Superintendent of the University Hospitals, emphasized the fact that the University Hospitals comprise a teaching institution; their present bed capacity is 500, and it is reasonably adequate for that purpose with certain exceptions of addition for special conditions. If the hospital were to try to take care of all the indigent in the state, Mr. Amberg thought that a 5,000-bed hospital would be needed, because, even now, the waiting list averages 1,000 patients. The hospital tries to present to its students a cross-section of medical problems that they will encounter in practice; that is why many tonsillectomy cases must be turned away and why many hernia cases remain long on the waiting list. Some emergency cases are taken since it is evident that a certain amount of emergency work is important from the teaching standpoint.

The problem of the indigent then reverts to the local board in charge. Medical societies in recent years have encouraged as far as possible the care of the indigent in their local areas because traveling expenses, accommodations, while waiting for admission to the hospital, attendant and nursing care, outside the hospital are costly.

The state society has felt also that aside from the question of costs, people get quicker service in their local community. The question is how to present this to the boards who have local control. In this the doctors themselves must take a good share of the educational process. The state association has felt in the past that not enough emphasis has been placed on social relationships the student is going to encounter when he enters into practice. Even for those students who are not going into private practice the view-point of organized medicine represent-

ing largely the private practitioners should be given to future teachers and public health workers, so that they will understand fully the problems of private practice.

We have been pleased with the compulsory senior lectures instituted along these lines and wish to commend them.

GEORGE EARL, M.D.

DR. E. S. PLATOU: We recommend the adoption of the report of the Committee on State Health Relations and want to compliment the work of Dr. Sweetser, especially, in his very conscientious attendance at meetings of the State Board of Health.

We recommend the adoption of the report of the Committee on Public Policy with commendation for Dr. Sogge in his untiring efforts in behalf of the medical association.

We recommend also the adoption of the report of the Committee on University Relations with emphasis to be placed on the suggestion of Dr. Earl's Committee that careful study be given to the admission of patients to the University Hospital and Out-patient Department by local County Boards.

It was moved, seconded and carried that the recommendations of the Reference Committee be accepted.

Dr. Will then called for the report of the Reference Committee on Lay Education Reports. The following committee reports were reviewed:

REPORT OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

The work of this Committee so far has been largely a continuation of that excellent program devised and organized under the previous chairmanship of Dr. L. R. Critchfield of St. Paul. The next circumstance calling for brevity stems from the comparatively short period in which your Chairman of the Public Health Education Committee and the Chairmen of the various subcommittees of Child Welfare, Radio, Speakers' Bureau, Editorial, Red Cross and Tuberculosis have had to work. Plans, however, have been well laid.

It must be obvious that such relatively large committees, made up of members residing throughout the state, make meetings difficult. Nevertheless, the distribution of membership is the chief agency whereby the objectives and intentions are furthered and the purposes (particularly of an educational committee) are devised and understood.

Speakers' Bureau

Despite the difficulties of getting together all the members of various subcommittees most of them have had one or more sessions. Dr. F. H. Magney of Duluth, head of the Speakers' Bureau, has continued the effective method carried out in previous years. He reports for his Committee as follows:

"The College Lecture Course was offered to the college on the same basis as last year and 16 colleges accepted. The lectures were officially limited to two for each college but one college especially requested and received four lectures. The subjects selected for the year are enclosed.

"The most popular subject was 'Mental Hygiene Problems of College Students.'

"Other talks arranged through the Speakers' Bureau this year were practically all in response to the offer made in the newspaper for speakers on the subject of the month. Talks were made before PTA groups, luncheon clubs, church groups, Auxiliary groups and others. So far this year twenty-seven talks have been booked through the State Office and there will be many more before 1941. In addition to this number, there have been many talks given by our members for which material was provided by the Speakers' Library, but about which we have no definite information as to date and place. Many of these requests have been for material on government medicine and an unusual number have been from doctors' wives. A total of one hundred or more such requests have been made this year to the State Office." The outline of the College Lecture Course follows:

MENTAL HYGIENE PROBLEMS OF COLLEGE STUDENTS—G. R. Kamman, St. Paul; B. C. Schiele, U. of Minn.; L. R. Gowan, Duluth; P. H. Heersema, Rochester.

YOUTH AND SOCIAL HYGIENE—R. R. Sullivan, U. of Minn.; H. G. Irvine, Minneapolis; W. E. Hatch, Duluth; P. A. O'Leary, Rochester.

THE NATIONAL HEALTH PROGRAM—George Earl, St. Paul; W. A. O'Brien, U. of Minn.; A. W. Adson, Rochester.

SKIN GAME (On cosmetic problems and skin diseases of students)—F. W. Lynch, St. Paul; C. W. Laymon, Minneapolis; F. T. Becker, Duluth; L. A. Brunsting, Rochester.

GETTING READY FOR MARRIAGE (On mental and physical preparation necessary for successful marriage)—J. J. Swendsen, St. Paul; L. A. Lang, Minneapolis; R. J. Moe, Duluth; J. A. Haugen, Minneapolis.

ONE STEP AHEAD (On good posture and foot health for students)—S. W. Shimonek, St. Paul; E. T. Evans, Minneapolis; M. H. Tibbetts, Duluth; H. B. Macey, Rochester.

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CHEMISTRY IN MEDICINE (Covering particularly the new drugs such as sulfanilamide and sulapyridine and others)—M. H. Hoffman, St. Paul; Harold N. Wright, U. of Minn.; F. J. Hirschboeck, Duluth; H. R. Butt, Rochester.

AFTER THE ACCIDENT—WHAT? (On First Aid in general and particularly first aid for fracture cases)—R. M. Burns, St. Paul; R. F. McGandy, Minneapolis; F. J. Elias, Duluth; H. B. Macey, Rochester.

Child Welfare

The Child Welfare Committee with Chairman R. L. J. Kennedy of Rochester held at least one meeting in St. Paul recently and a report of their work will be available later to the delegates.

Radio

The radio continues to be one of the most efficient means of influencing public opinion. The profession in Minnesota will never be able adequately to estimate the good that has come to our profession through the development of the broadcasting on medical subjects by Dr. William A. O'Brien. Since he has become engrossed in the graduate education feature in terms of the Continuation Courses at the University, he has been singularly equipped and in a position to sense the various needs of our guild, as well as to forecast the situation where newer scientific research points the way. With a simple but engaging technic and with a capacity for gentle humor antidoting any tendency to magnify fear (always so much associated with disease) he is able to disseminate useful information to ever increasing audiences. Chairman R. M. Burns of St. Paul with his committee have continued to serve most effectively. The report of his committee is attached.

Change Planned

I am unable to report at this time of the work of the Editorial Committee chairmaned by R. M. Hewitt of Rochester who has been ill. However, I know they are working and planning, it is understood, a change in the news service so long issued to country newspapers by this committee.

First Aid

A. B. Stewart of Owatonna, chairmaning the First Aid and Red Cross Committee, has been very active. I quote from his report as follows:

"As Chairman of the First Aid and Red Cross Committee of the Committee on Public Health Education I have little to report.

"I have statistics with detailed information in regard to the Red Cross activities in Minnesota, including First Aid instruction, Highway First Aid and Vaccination and Immunization. The latter has a separate committee, with Dr. Critchfield as chairman. I wrote to him some time ago offering him what information I had. I believe we might, each, accomplish more if we worked together.

"As the St. Louis Headquarters of the Red Cross have expressed pleasure in the activities that I have outlined to them I believe that I shall urge Red Cross chapters to push Immunization campaigns.

"Out of the 61 chapters in the state, only 14 have done so. I have not thought it advisable or necessary to call the committee together especially as we are so distant from each other."

Tuberculosis

Concerning tuberculosis, Chairman J. A. Myers of Minneapolis and his committee have been most active. A report of the work of this committee is also attached.

In passing I may state that the Minnesota Public Health Association has likewise been active concerning further ways and means of directing the anti-tuberculosis program. Dr. C. B. Wright of Minneapolis, chairmans a committee of the Public Health Association having to do with the period when previously treated subjects may safely be employed. To determine through mass methods the extent of infection, especially in the lower income employed groups, has been given much study. Out of all this some unified program will gradually evolve.

Packet

The Speakers' Library Service with the monthly packet dealing with various subjects and available through the State Medical office is very popular. Especial thanks is due the University and associated hospitals and their staffs and the State Department of Health for much of the material collected and used.

New Problem

Finally your Chairman feels that there is a great untouched field in the direction of the better organization of medical service through a study of the striking changes in the percentages of the population at various age levels. Gradually we are arriving at a point where without decisive decrease or increase in the prospective age groups under 20 we face a situation in which a tremendous increase is taking place and will continue to do so in the age levels over 60. In that group there is developing a much stronger trend toward octogenarianism among women than with men. In our courses of instruction in medical schools, in the organization of our hospitals, in the attitude of mind and the technics developing in our various specialties, in the daily rounds of the general practitioner, there is a great need for continuous discussion and among other things the need of familiarizing ourselves with the broader aspects of geriatrics.

E. L. TUOHY, M.D.

REPORT OF THE RADIO COMMITTEE

The radio program has continued to be carried on during the past year by Dr. W. A. O'Brien, director of postgraduate education at the University of Minnesota. A list of the subjects and the general plan of Dr. O'Brien's weekly broadcasts for the past year is attached to this report. It will be noted that the broadcast on the last Saturday of each month was on dental health and was sponsored by the Minnesota State Dental Association.

The radio program of the Minnesota State Medical Association is now 12 years old, one of the oldest of its sort in the entire United States, and, undoubtedly, one of the most popular.

The committee feels that the association and Dr. O'Brien are to be congratulated on this record and that our sincere appreciation should be extended to WCCO for its unfailing and courteous service. As far as possible, also, the committee hopes that the example of the St. Louis County Medical Society in securing these broadcasts over direct wire to their local station, KDAL, will be followed. It should be realized, of course, that WCCO has no direct affiliations with any other stations except WLB in Minnesota, at the present time, and that only by a special combination of circumstances would a direct wire be available over which the broadcasts could be carried. Dr. O'Brien has participated in individual broadcasts over WCCO, WLB, KSTP, and WTCN in addition to the regular program.

Offers of regular broadcast time have also been received by other stations not affiliated with WCCO, notably by KSTP, which is affiliated with a chain of smaller stations in Minnesota. The committee is of the opinion that the offer from KSTP, especially, should be accepted and several conferences have been held with members and with officials of KSTP on the matter. It is the general consensus that a different type of program should be developed for this purpose and several suggestions have been made. One is for the currently popular round-table type of program. Another is for a program series to be conducted by an Inquiring Reporter who collects the questions of average citizens on a given subject and submits them over the air to one or two experts, the experts to change from program to program. Details for some such program will be worked out in the near future and experiments will probably be made in series of weekly programs over this station and its affiliates.

In the meantime another experiment is now under way in connection with Dr. O'Brien's program which, if it is successful, will be made a definite part of the program. That is, to provide copies of Dr. O'Brien's talks, transcribed at the time of the broadcast, to any listeners who wish to send 10 cents for it to cover postage, cost of mimeographing, and mailing.

Arrangements for broadcasts by distinguished visitors, together with daily résumés of meeting events were made by the committee in connection with the Minneapolis meeting in 1939 and the total series covering many phases of medicine and of the work of organized medicine was undoubtedly of great public interest. Broadcasting arrangements in Rochester do not permit of so extensive a program in connection with the 1940 meeting, but similar arrangements will be made at the next big city meeting.

R. M. BURNS, M.D.

Medical Broadcasts

April 1, 1939—March 31, 1940

- April
 - 1 Cause of Cancer
 - 8 Cancer in Women
 - 15 Cancer in Men
 - 22 Early Diagnosis of Tuberculosis
 - 29 Cancer of the Head and Neck
- May
 - 6 Prenatal Care
 - 13 First Year of Life
 - 20 Prematurity
 - 27 Prenatal Care of Teeth
- June
 - 3 Minnesota State Department of Health
 - 10 Sanitation
 - 17 Health Education
 - 24 Dental Health Problem
- July
 - 1 Drowning
 - 8 Postgraduate Medical and Hospital Education
 - 15 Hot Weather Health Hints
 - 22 Poison Ivy
 - 29 Oral Hygiene
- August
 - 5 Mental Disease
 - 12 Diphtheria
 - 19 Smallpox
 - 26 Getting Children Ready for School
- September
 - 2 Cause of Accidents
 - 9 First Aid
 - 16 Accidental Infection
 - 23 Shock and Hemorrhage
 - 30 Injuries of the Teeth and Jaws
- October
 - 7 Social Hygiene
 - 21 Nursing Education
 - 28 Dental Progress
- November
 - 4 Tuberculosis
 - 11 Pneumonia
 - 18 Common Cold
 - 25 Nutrition and the Teeth

- December
 2 Pernicious Anemia
 9 Iron Deficiency Anemia
 16 Deficiency Diseases
 23 Streptococcal Infection
 31 Care of the Teeth
 January
 6 Diphtheria and Smallpox
 13 Whooping Cough and Scarlet Fever
 20 Measles and Chicken Pox
 27 Orthodontia
 February
 3 Cause of Dyspepsia
 10 Peptic Ulcer
 17 Appendicitis
 24 Periodontia
 March
 2 Rheumatic Fever
 9 Arthritis
 16 Gout
 23 Injuries of Joints
 30 Exodontia

REPORT OF THE SUB-COMMITTEE ON TUBERCULOSIS

The Sub-Committee on Tuberculosis held its first meeting on February 24, 1940. The following were present:

- J. A. Myers, Minneapolis, *Chairman*
 B. S. Adams, Hibbing
 C. A. Stewart, Minneapolis
 H. Z. Giffin, Rochester
 H. E. Hilleboe, St. Paul
 E. J. Simons, Swanville
 L. H. Flancher, Lake Park
 E. A. Meyerding, St. Paul
 K. H. Pfuetze, Nopeming
 S. A. Slater, Worthington
 Mr. R. R. Rosell, St. Paul

Dr. Myers briefly outlined the history of the Committee on Tuberculosis, stating the objectives of the Committee when it was first formed and the present objectives. In connection, slides were shown, showing the comparison between the United States and England in the eradication of tuberculosis in cattle. Additional slides of x-rays, showing the different stages of tuberculosis in humans, were also shown.

Dr. Stewart submitted his proposed State-wide Anti-tuberculosis campaign, outlining both the Ideal and Economical Plans.

A general discussion of the plans followed, with Doctors Slater, Pfuetze, and Flancher relating their progress in TB work in their own respective counties.

Dr. Hilleboe outlined the program of the Division of Social Welfare and offered his cooperation with Dr. Stewart's plan, advising that they both work together.

Dr. Stewart suggested that the members present decide on certain major points of the plan, which they were to follow, and after the plan is under way, the details could be worked out. The following objectives were agreed on:

Ideal Plan:

1. Apply the TB test to the entire personnel of each household unit in every county.
2. X-ray every positive reactor.
3. Additional laboratory and medical examination to complete the diagnosis.
4. Provide adequate segregation and treatment for each case as long as he is infectious.

Economical Plan:

1. Concentrate x-ray studies particularly on the tuberculin sensitive adults present in each home in which tuberculin sensitive children are found.
2. X-ray adults who are positive reactors who have children who have negative reactions to tuberculin.
3. Reapply a TB test to all future members of population and all who were negative on previous survey at least annually.
4. Concentrate x-ray studies particularly on tuberculin sensitive adults in each home in which tuberculin sensitive children are found, who previously reacted negative to the test, and repeat them at least annually.

Dr. Stewart advised that financial aid would have to be solicited from different organizations such as the Minnesota State Medical Association, Hennepin County Medical Society, U. S. Public Health Service, and Foundations.

It was recommended that different groups such as the State Board of Health, Hennepin County Medical Society, American Medical Association be invited to send representatives to a meeting of the Tuberculosis Committee after the plan is under way.

It was agreed that a meeting be held March 26 of the members present and that Dr. Chesley of the State Board of Health be invited to attend.

The second meeting was held on March 26, 1940. The problem of the incorrigible tuberculous patient, that is, the one who has tuberculosis in the contagious stage, but who refuses to be admitted to a sanatorium, was discussed at some length by Drs. Slater and Flancher. Various methods of controlling them, such as quarantine, were considered and it was moved by Dr. Slater that the Committee go on record as favoring the state's sponsoring or providing an institution where the incorrigible tuberculous patient, or the one that might be considered a menace to the community, could be taken care of under such conditions so as to provide proper treatment and

at the same time retain the patient until it is safe for him to return to his community. The motion was seconded by Dr. Pfuetze and was carried.

The tuberculin test was discussed at some length and the Committee voted unanimously to recommend that the physicians of this state use the intracutaneous method of Mantoux. Considerable confusion has arisen concerning the reading of the tuberculin test. Inasmuch as there apparently has been a strong tendency to over-read the reactions, the following points were presented by Dr. Slater:

1. The tuberculin test should never be read until forty-eight or preferably seventy-two hours after administration.
2. Not more than one test should be given at a time.
3. When the first test is given with a small dose of tuberculin, a stronger dose may be administered in seventy-two hours, if there is no reaction from the first dose.
4. A tuberculin reaction consists of induration or edema. Redness of the skin at the site of administration, in the absence of induration, should never be considered as a reaction.
5. The degree of reaction depends on the extent of the induration and may be indicated as one, two, three, and four.

The Committee voted to recommend the ideal plan of tuberculosis control for the state which Dr. Stewart presented at the previous meeting. To supplement this, it was recommended that one county be selected to serve as a laboratory; that is, where an attempt be made to carry out in detail the ideal plan with reference to the tuberculin test, the x-ray film, and the complete examination for tuberculosis of everyone in the county.

The Committee voted unanimously to hold regular meetings, the next one to be during the convention of the State Medical Association in Rochester.

J. A. MYERS, M.D.

DR. R. M. BURNS: Your committee on Lay Education has made a thorough study of these reports. We wish, first of all, to commend the thoroughness and conciseness of these reports and heartily agree with their content. The Speakers' Bureau has had success and there is increasing demands for these talks. The radio has been a most effective means of influencing public opinion and we are happy to learn of the Duluth hook-up. We hope future stations will still be added. Dr. W. A. O'Brien is to be especially commended for his untiring work and the manner in which his talks are presented and the extent of the subjects covered.

The report of the Sub-Committee on Tuberculosis, headed by Dr. J. A. Myers, has been read. This report indicates that extensive study has been made of this subject, and the Committee endorses the recommendations of the Sub-Committee on Tuberculosis.

It was moved, seconded and carried that the report of the Reference Committee be accepted.

DR. W. W. WILL: We will now have the report of the Reference Committee on Medical Economics reports. The following committee reports were reviewed.

REPORT OF THE SUB-COMMITTEE ON PROFESSIONAL EDUCATION IN MEDICAL ETHICS AND SOCIAL AND ECONOMIC TRENDS

The last meeting of this committee took place on May 31, 1939, at which time the following members were present: Dr. H. S. Diehl, Minneapolis; Dr. J. J. Swenson, St. Paul; Dr. G. C. MacRae, Duluth; and Dr. Louis A. Buie, Rochester.

Inasmuch as other committees are taking care of social and economic problems, the duties of this committee should be limited, it has been felt, to problems of an ethical nature. It was suggested to the group meeting of the Economics Committee that the name of the subcommittee be changed and that henceforth it be known as the Subcommittee on Medical Ethics. It was also suggested that the number of members of the committee be reduced. There are now eight members and it is felt that three members should suffice. The group committee approved of the recommendation. This plan is therefore submitted to the House of Delegates for its approval.

Methods were discussed whereby information might be disseminated on the subject of Medical Ethics and it was decided that Drs. MacRae, Swenson and Buie should inquire of local medical societies regarding ethical problems of interest which have arisen in the past. It was agreed that helpful information concerning such problems should be published from time to time in MINNESOTA MEDICINE. This work has been planned and partially carried out. Your committee has found it advisable to proceed cautiously with this plan.

Dr. Diehl's program for undergraduate medical students was discussed and his work commended. The names of additional speakers were considered and several were recommended to Dr. Diehl for use in his program of lectures.

The committee has been active since its last meeting. Several important problems have come to its attention and have been handled satisfactorily. In each instance we have had the very fine cooperation of members of the Council, Mr. Brist and Mr. Rosell, and the advice and assistance of these men were largely

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responsible for the successful management of each case. Many ethical problems border very closely on those which are medico-legal and it is probable that there will be few ethical difficulties which can be analyzed and solved without the assistance of the above mentioned individuals.

The attached is a schedule of Dr. Diehl's lectures for the 1940 term.

L. A. BUE, M.D.

Orientation to Practice—Spring 1940 (Schedule of Lectures)

April 5 *Opportunities in and Preparation for Practice:*

General practice; specialization; industrial medicine; government service; insurance medicine; teaching and research; graduate and post-graduate training

Dr. H. S. Diehl

April 12 *Medical Licensure:*

State and National Boards; Basic Science Boards; reciprocity; Narcotic Licenses; responsibility of Licensure; revocation of license to practice medicine.

Dr. A. W. Adson

April 19 *Quackery, Fads, Cults and Patent Medicines:*

Definition and description; reasons for existence; relationship to the practice of medicine and to the public health; attempts at control; borderline types of practice by physicians.

Dr. W. A. O'Brien

April 26 *The Ethics of the Practice of Medicine:*

Responsibility of physicians to their patients and to each other; consultations; fee splitting; relationship to druggists, to nurses; euthanasia.

Dr. F. J. Hirschboeck

May 3 *The Management of the Public and Private Patient:*

Winning the patient's confidence; the diagnosis; the prognosis; cooperation of the patient in carrying out treatment; the patient's family; his job; his bills for medical and hospital care.

Dr. S. M. White

May 10 *Starting the Practice of Medicine:*

Choosing a location; problems of the young practitioner, relationship to other physicians; to hospitals; getting acquainted; determination of fees. Individual and group practice. Partnerships.

Dr. J. M. Hayes

May 17 *Malpractice:*

Definition; justified and unjustified malpractice suits; examples; safeguards against malpractice; malpractice insurance.

Dr. B. J. Branton

May 24 *The Physician in Court:*

In industrial compensation cases; as an expert witness in criminal suits; in personal injury suits; in malpractice suits.

Judge Paul Carroll

May 31 *Medical Care of the Indigent and of Low Income Groups:*

Cost of medical care; system of individualistic practice; free and pay clinics; state medicine; health insurance; hospital insurance; attitude of organized medical profession; trends in this country.

Dr. R. E. Scammon

June 7 *Medical Organizations:*

National, State and local; purpose; types of organizations; activities; advantages of membership.

Dr. C. B. Wright

REPORT OF THE MEDICAL ADVISORY COMMITTEE

It will be the purpose of the Chairman of the Medical Advisory Committee to give a verbal account of the work carried on by this Committee during the past year at the meeting of the House of Delegates. Because of the confidential nature of the contents, it is not being sent to the delegates at this time.

B. J. BRANTON, M.D.

REPORT OF THE SUB-COMMITTEE ON LOW INCOME AND INDIGENT PROBLEMS

During the past year our main project centered in the making of a survey of the state as regards the handling of relief, old age pension cases and dependent children. A complete survey was made of every county and nearly every township, also, at the same time, getting opinions from doctors. The report is now on file in the office of the secretary of the society. It did bring out many enlightening facts, many of which, I am quite sure, will be straightened out within the coming year.

During the past year a survey has been made by the Wright County Medical Society as to whether it wished to come under the Farm Security Administration program as far as medical care is concerned for clients of the Farm Security Administration. After very thorough study members of the Wright County Medical Society unanimously decided not to accept the plan. They expressed themselves as satisfied with the relief plan they have at the present time, and will take their own chances on making collections.

No other Farm Security proposals have been considered during the past year. Judging from the experience of neighboring states, we do not believe they will be necessary in this state in 1940.

As to the question of medical insurance plans to be carried out throughout the state, nothing has been very definitely proposed. We are perfectly willing to bide our time, and see what experiments are being carried out in the state of Wisconsin.

consin and some of our neighboring states, and we may learn a great deal from their efforts.

Mr. Finke, in charge of the welfare department throughout the state, is gradually formulating plans whereby there will be more uniform handling of relief matters than there has been in the past.

No grave complaints of methods of handling the low income group have been made during the past year. What the future may bring remains to be seen.

It is the recommendation of this Committee that the name of the committees now known as County Contact Committees be changed to County Medical Advisory Committees. The reason for the change is to better define the purpose and duties of these committees for associates and Welfare Boards in the counties.

W. A. COVENTRY, M.D.

REPORT OF THE COMMITTEE ON CONTRACT PRACTICE

Your Committee has held one meeting during the year, at which time several issues were discussed, the principal one being the case which has been pending for some time in regard to certain contract practices with the Eagles Lodge. There are some court actions on the docket in regard to this, but no definite information is available at this time.

It is the unanimous opinion of your Committee that it would be advisable for the Council collaborating with this Committee to reiterate their definitions and limitations of any and all so-called contract practices. There are a number of members who have contracts of various sorts with industrial firms and groups of various kinds and reiteration of the stand of the Council and the Officers of the Society at this time would not be amiss.

F. A. OLSON, M.D.

REPORT OF THE COMMITTEE ON INDUSTRIAL RELATIONS

The council of the City of St. Paul last fall announced the appointment of five physicians to take care of city employees injured in the line of duty. At the same time, employees were informed that medical fees would be paid only to these physicians.

Immediately, thereafter, members of the Ramsey County Medical Society passed a unanimous resolution in opposition to the action and expressed their willingness to continue to care for any city employees who might wish to come to them, pending final disposition of the matter.

Subsequently a St. Paul fireman was injured on duty and was treated, at his own request, by his family doctor. This doctor was not one of the five selected and the City Council refused to pay his fee though no question was raised as to its fairness.

The fireman's case was appealed to the Industrial Commission and the Commission upheld the city in this matter. Thereupon the St. Paul Trades and Labor Assembly took over the case for the fireman and appealed to the Supreme Court for a decision.

At the direction of the Council of the Minnesota State Medical Association, Mr. F. Manley Brist, attorney for the association, then filed a brief, as friend of the court, defending the right of the injured employee to his choice of physician. A brief in defense of this right was also filed by the Minnesota State Federation of Labor.

The case was heard by the Supreme Court on April 1 and no decision has been handed down as yet. It is hoped that the decision when it comes will be favorable.

STEPHEN H. BAXTER, M.D.

REPORT OF THE EDITING AND PUBLISHING COMMITTEE, MINNESOTA MEDICINE

For Period January 1, 1939, through December 31, 1939

The year 1939 proved to be a banner year for Minnesota Medicine from the standpoint of increase in revenue, the net surplus being the largest ever shown in its twenty-two years of publication. The net cash surplus amounted to \$1,679.32 as compared to \$934.76 for the previous year. The nearest approach to the 1939 surplus was that for 1929, which amounted to \$1,081.52.

During 1939 there were printed a total of 37,900 copies, or an average of 3,159 per issue. The total number of pages amounted to 1,208, or an average of 100.6 per issue. Of this number 890 were devoted to reading and 318 to advertising. The reading pages included 127 scientific articles, including those presented in the Proceedings of the Minnesota Academy of Medicine and the Minneapolis Surgical Society. In addition there were seven abstracts of papers and fifteen case reports. This number does not include the case reports appearing in the body of many of the scientific articles. Illustrations numbered 150, an average of 12.5 illustrations per issue.

The special sections devoted to Medical History of Minnesota and Medical Economics occupied 77 pages and 76 pages, respectively, or an average of about 6.5 pages per issue. Other special sections included editorials, reports and announcements of societies, news items, book reviews, the yearly roster and minutes of the annual meeting of the Association. There are now 158 pages of type matter relating to the Medical History of Minnesota. In accordance with our promise, we are holding this in page form.

At the close of 1939 our records showed the total number

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of paid membership subscriptions to be 2,503, with about 135 subscriptions carried the first part of the year as delinquent accounts. There were 204 non-member subscriptions. Miscellaneous distribution, including single copy sales, exchanges, complimentary copies, advertisers' checking copies, et cetera, numbered 351 copies, leaving a surplus of about 100 copies for possible distribution in filling orders for back copies and for sending sample copies to prospective subscribers and advertisers.

The outlook for 1940 is of course somewhat uncertain. However, there seems to be a general feeling that conditions will not be worse than in 1939 and possibly better, even though it is election year. In difficult times like these, no reasonable assurance can be given for any definite period of time.

It is encouraging, however, to know that the first quarter of 1940 shows a substantial increase over the corresponding period for last year, and the first three months shows an excellent condition.

Your attention is again called to the fact that a substantial volume of advertising has to be declined because the products have not been approved by the Council of the A.M.A. One Minneapolis firm recently offered a contract for \$100 an issue, or four full pages in each issue, which could not be accepted because of these restrictions. In the end, however, we feel that this policy commands the confidence and respect of readers as well as of national advertisers.

During the year Dr. J. T. Christison, for more than fifteen years a member of the Publication Committee, and for ten years its chairman, retired from practice and from his place on this committee.

The long, faithful and efficient service which Dr. Christison gave to MINNESOTA MEDICINE is deserving of the most sincere appreciation of every member of this Association. It was a work in which he was deeply interested, and to which he gave a considerable portion of his time. I feel that he should be given a vote of thanks for his splendid service.

In accordance with the authority of the Council a special feature was included with the January, 1940, issue of the Journal. This consisted of the publication of a 52-page supplement, and of 600 additional copies of that issue. The cost of this was charged against the net cash earnings for 1939. Other features may be included in the Journal during the year, with the approval of the Publication Committee and the authority of the Council.

E. M. HAMMES, M.D.

STATEMENT OF INCOME AND EXPENSE AND PROFIT AND LOSS, MINNESOTA MEDICINE

For the Period January 1, 1939, through December 31, 1939
ACCURAL BASIS

INCOME	
Display Advertising	\$ 9,577.19
Member Subscriptions	4,834.50
Non-member Subscriptions	587.43
Reprint Income	150.22
	<u>\$15,149.34</u>
Less:	
Bad Accounts Charged Off.....	58.09
(See Schedule A)	<u>\$15,091.25</u>
EXPENSE	
Journal Expense	\$12,265.20
Discount and Commissions	
Advertising	1,405.64
Subscriptions	14.40
	<u>\$13,685.24</u>
Profit for Period	\$ 1,406.01

Schedule A

BAD ACCOUNTS CHARGED OFF

N. W. Artificial Limb Co.....	\$ 9.69
Sonotone Minnesota Co.....	47.40
E. W. Broden	1.00
	<u>\$58.09</u>

Schedule B

JOURNAL EXPENSE

Paper Stock	\$ 1,453.47
Printing Expense	5,479.42
(Includes composition, makeup, lockup, presswork, bindery work and addressing)	
Editorial Salary—Dr. Drake.....	1,200.00
Illustrations	497.21
Second class postage and postage used on Minneapolis and foreign copies.....	410.63
Mailing envelopes for Advertisers copies.....	13.85
Bruce Publishing Co.—Service Fee.....	1,680.00
(Covers business management, stenographic service, mechanical editing of all material, ordering all cuts, making up dummy, mailing all proofs, bookkeeping, billing and collecting all accounts, keeping up mailing list, etc.)	
Bruce Publishing Company.....	132.00
(Covers telephone, telegrams, addressograph plates, etc.)	

Advertising Commission	1,064.32
(Including 5% received from advertising placed through CMAB)	
1939 Copyright Fee	24.00
Stationery	35.30
Insurance bond—J. R. Bruce, Bus. Mgr.....	5.00
	<u>\$12,265.20</u>

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS, MINNESOTA MEDICINE

For the Period January 1, 1939 thru December 31, 1939

SOURCE OF CASH RECEIPTS	
Display Advertising	\$ 9,769.93
Member Subscriptions	4,834.50
Non-member Subscriptions	587.43
Reprint Income.....	172.70
	<u>\$15,364.56</u>
Less:	
Discounts and Commissions	
Advertising	\$1,405.64
Subscriptions	14.40
	<u>1,420.04</u>
Net Cash Receipts	<u>\$13,944.52</u>
CASH DISBURSEMENTS	
Journal Expense	12,265.20
Cash Surplus for Period.....	\$ 1,679.32
Accounts Receivable January 1, 1939.....	\$1,122.17
Accounts Receivable December 31, 1939.....	848.86

REPORT OF THE COMMITTEE ON SICKNESS INSURANCE

At a recent meeting of the Committee on Sickness Insurance of the Minnesota State Medical Association, a free discussion was conducted concerning the various plans that are being experimented with in different cities, counties and states, as well as a discussion of the general policy the committee should take concerning plans that might develop within our own state.

Members of the committee agreed that there was no need for the proposal of a state plan at the present time, but that the committee should keep on file in the Secretary's office copies and reports of all plans and the results of such plans for reference in the event that some city or county should feel inclined to develop some type of group sickness insurance.

In brief, the committee wishes to assure the House of Delegates that we are vitally interested in this subject, but we prefer to take a passive rather than an active interest in initiating any sort of plans.

The committee expressed itself as not favoring any plan which might be started by a few doctors in a community, unless it has the approval of the county society, and furthermore, any such plan should include the whole medical group in the county. It was thought advisable that any proposed plan should be first submitted to the Committee on Sickness Insurance which will refer it to the Council, for further consideration.

A free discussion took place concerning the advisability of carrying on a pro-medical publicity program. The committee concluded that it would be unwise to initiate such a program, but it should be prepared to counteract any unfavorable propaganda that might arise concerning compulsory state health insurance.

There appears to be an abundance of material on the affirmative side of socialized medicine and the question of the proper method of disseminating literature on the negative side was discussed. Mr. Crownhart's book on "Sickness Insurance in Europe" was one publication the committee felt should be given wide distribution. Furnishing libraries, particularly college libraries in towns of 10,000 population and over, was another means of distributing material. Doctor Adams was instructed to consult the Council of the Minnesota State Medical Association relative to the cost and advisability of furnishing libraries with this book.

It was also agreed that Doctor Adams and Mr. Rosell should make a survey of the situation with regard to material available on the subject of Socialized Medicine and also where this material should be distributed.

Doctor Cranmer explained in detail the Hennepin County Medical Society plan. Doctor Sivertsen discussed a proposed plan, and Doctor Alberts discussed the plans that Ramsey County has in mind.

Submitted by those in attendance at the meeting of the Committee on Sickness Insurance, in St. Paul, on March 22, 1940.

A. W. ADSON, M.D.

REPORT OF THE COMMITTEE ON MEDICAL ECONOMICS

Developments affecting the economic side of medicine have gone on apace. Probably of outstanding importance has been the tactical defeat of the Wagner Bill, largely due to opposition developed in the ranks of federal authorities themselves. The forces of the American Medical Association and their friends were arrayed against it, and their stand was undoubtedly a powerful obstacle. Nevertheless, the change in the attitude of "high-

er-ups" toward the proposed plans of the National Health Program apparently was the deciding factor. Of great importance is the recent change in attitude of federal authorities toward the representatives of organized medicine. Instead of the former ostracism from federal health councils, representative physicians of late have repeatedly been called on for counsel. The President's hospital bill, recently introduced in Congress, is a far cry from the National Health Program. It is quite probable that this bill will be modified according to the suggestions of officials of the American Medical Association. Some of the phases of Medicine are still playthings of social reformers and politicians, although for the time being at least there is a pause in their activities. It is barely possible that it has finally been realized that the physician is better equipped to make any necessary adjustments in medical distribution than the unholy alliance of social reformers and politicians. The idealistic stand of the physician toward Medicine seems to be rather difficult for some laymen to comprehend. That the physician will resist any changes which he believes will be detrimental to Medicine, even though they may be to his economic advantage, seems hard for the lay mind to grasp. The recent decision of the Appellate Court to the effect that Medicine is not necessarily a profession but can be regarded as a trade has imperiled the status of organized medicine. The case is now in the hands of the Supreme Court and its decision will be of great importance.*

During the past year several state and county medical societies have endeavored to solve the problem of the cost of medical care by voluntary sickness insurance, carried on under their supervision. The State Medical Associations in California and Michigan, with the consent of the legislatures, have already set up plans for voluntary sickness insurance. It is too early to determine the results, but disappointment has been expressed because of the small number of subscribers who are availing themselves of this opportunity. Largely those with an income which would place them well above that of the medically indigent have availed themselves of it. This is true in spite of the fact that the monthly rate asked by the California Medical Association is so low that in the minds of many physicians it would be impossible to deliver good medical care. It would seem that some of the people who want changes, want them at little or no cost to themselves.

Theoretically it would seem that some form of *voluntary* sickness insurance would be an ideal solution of the problem. However, such insurance has many faults to be overcome. It has been claimed that *compulsory* health insurance is the only way to insure widespread acceptance. Those who are at all familiar with compulsory insurance, however, realize that there are but few who would be willing to see it adopted. The solution of the financial problems of medical care is necessarily in the hands of the physician and it will gradually be worked out in the best interests of all concerned.

The Minnesota State Medical Association has wisely continued its policy of observing the various attempts made by state and county societies to find some solution. Fortunately for us, there is no urgent need in Minnesota for adjustments other than those which are already being made by the physicians of various communities. It can safely be said that our Council and the committees interested will keep themselves informed.

The Bureau of Medical Economics of the American Medical Association published during the year the report of the nationwide Survey of the Demand and Supply of Medical Care, in which many members of the Minnesota State Medical Association took part. Great credit is due to the Bureau for the completion of this monumental undertaking. While the report from Minnesota was not as voluminous or complete as might be desirable, nevertheless it contained many data which were of definite value. Some states, such as Pennsylvania, New Jersey and others, made very painstaking and complete reports. Some of the county societies, particularly Cook County, spent much time and money in completing the survey and as a result made recommendations which were definite contributions to the medical situation in their counties. It is unfortunate that more physicians could not be induced to participate actively in the survey. The time undoubtedly will come when the medical profession will be called upon again to make an inventory, possibly in a more simplified form. Now that the physicians have been awakened to the value of such a survey, a more enthusiastic response is to be hoped for.

A meeting of the Sub-committees on Medical Economics was held in St. Paul in December, at which some of the more recent economic problems were discussed. A report of some of the discussions was published in the January number of MINNESOTA MEDICINE. There is no doubt that a meeting of this kind acts as a stimulus to the various sub-committees and also permits of more adequate coöperation.

At the request of the Council, a Committee on Sickness Insurance was appointed last fall. The membership of this committee is as follows: Dr. A. W. Adson, chairman, Dr. E. D. Anderson, Dr. L. A. Buie, Dr. R. R. Cranmer, Dr. O. W. Holcomb, Dr. G. C. MacRae, Dr. O. I. Sohlberg, Dr. W. W. Will. This committee promises to correlate all the information on this vital subject and should be of practical value in forming any new plans which might seem advisable to solve the problems involving insurance in our own state.

Of outstanding economic interest is the recent appointment by the Minnesota Division of Social Welfare of an Advisory Committee to coöperate with the head of the Division, Mr.

Walter Finke, on matters affecting medical care of those groups classified as indigent or medically indigent. This Advisory Committee is composed of the following members: Dr. A. W. Adson, chairman, Dr. E. J. Simons, Dr. C. A. Stewart, Dr. L. L. Sogge, Dr. W. A. Coventry, Mr. Walter Finke, and two ex-officio members, Dr. A. J. Chesley and Mr. R. R. Rosell. With the generous coöperation of Mr. Finke this committee has been successful in effecting a definite improvement in the status of the physician dealing with this class of patients. The report of this committee, which was submitted to the county contact committee, contains an excellent résumé of the progress which has been made.

During the year an attempt has been made by the Editorial Sub-committees to keep the members of our state association informed in the economic section of MINNESOTA MEDICINE as to current developments of economic interest. A perusal of these columns, together with those of the section of Organized Medicine in the *Journal of the American Medical Association* will keep every physician abreast of recent developments in the medical problems of economic interest which are of such vital importance to the future of Medicine.

W. F. BRAASCH, M.D.

Dr. M. C. Piper: I would like to make a preliminary suggestion if it is not out of place. It has occurred to me that some time in this program, somebody should express an appreciation to the Committees who have so faithfully performed their work during the year and brought in these very nice reports for us. Furthermore, it seems to me that we crowd this report of a year's work into the last part of the evening when we are all tired and not giving due emphasis to it. I should like to suggest that we give this part of the program of the Delegates more time and attention.

We advise the adoption of the recommendation in the first paragraph of the report of the Sub-committee on Professional Education in Medical Ethics and Social and Economic Trends; that the number of the Committee be reduced from the present eight members to three members, and that it be known as the Sub-committee on Medical Ethics. The Reference Committee wishes to add its recommendation regarding the series of undergraduate lectures as outlined by Dr. Diehl of the University.

The Reference Committee has no comment to make regarding the report of the Medical Advisory Committee.

We recommend the adoption of the report of the Sub-committee on Low Income and Indigent Problems and suggest the continuation of the activities of the committee. It is suggested, if feasible, some provision be made to acquaint the various County Medical Societies with the findings of the state survey referred to with suggestions regarding the relationship between County Medical Advisory Committees and County Welfare Boards. Of course, this resolution was drawn up before we heard this excellent discussion this evening.

We recommend the adoption of the report of the Committee on Contract Practice with the suggestion the Chairman be given the privilege of the floor for further amplification of a supplemental report.

The Reference Committee recommends the adoption of the report of the Committee on Industrial Relations.

The Reference Committee recommends the adoption of the report of the Editing and Publishing Committee, with this suggestion: that a vote of thanks be given on the part of the Association to Dr. Christison for his meritorious service on this committee. Furthermore, the Reference Committee wishes to compliment MINNESOTA MEDICINE on the publication of the supplemental issue of January, 1940, as well as for the favorable financial standing at this time.

The Reference Committee recommends the adoption of the report of the Committee on Sickness Insurance.

The Reference Committee recommends the adoption of the report of the Committee on Medical Economics and wishes to call attention to the statement in Paragraph 4 that there is no urgent need in Minnesota for adjustments other than those that are already being made, but feels that in a state, fortunately situ-

*Editor's Note: The case has now been remanded for trial to the District Court.

ated as Minnesota is said to be, some definite plan of solution of the care of the indigent and of the people not on relief but unable to afford adequate medical care should be inaugurated by this Association.

Dr. F. A. Olson, Chairman of the Committee on Contract Practice, and Mr. F. Manley Brist, Attorney for the State Medical Association, gave supplemental reports but their remarks were not recorded. Dr. B. J. Branton and Dr. L. L. Sogge likewise gave supplemental but unrecorded reports.

It was moved, seconded and carried that the report of the Reference Committee on Medical Economics Reports be accepted.

A Committee on Resolutions, composed of Dr. D. P. Head, Dr. E. M. Hammes and Dr. E. C. Bayley, was appointed by Dr. Will to report at the next meeting of the House.

At the request of Dr. Will, the Necrology report was then given by Dr. B. B. Souster, Secretary, as follows:

NECROLOGIST'S REPORT

MEMBERS

Olav N. Birkeland, Hibbing. Born 1887. Northwestern University 1917. Died February 2, 1940. Aged 52.

Ernest H. Bohland, St. Paul. Born 1874. Minneapolis College Physicians and Surgeons 1903. Died January 10, 1940. Aged 65.

E. E. Cress, Boyd. Born 1884. Northwestern University 1910. Died May 14, 1939. Aged 55.

John F. Cumming, Morris. Born 1898. University of Toronto 1922. Died July 12, 1939. Aged 42.

Charles E. Fawcett, Stewartville. Born 1869. Northwestern University 1893. Died December 8, 1939. Aged 70.

Henry P. Fischer, Shakopee. Born 1870. Wayne University 1894. Died January 24, 1940. Aged 68.

W. R. Hand, Elbow Lake. Born 1856. Cincinnati College of Medicine and Surgery 1877. Died May, 1939. Aged 83.

Elmer C. Hanson, Austin. Born 1896. University of Minnesota 1922. Died June 23, 1939. Aged 42.

Melvin M. Hauge, Clarkfield. Born 1876. Minneapolis College Physicians and Surgeons 1907. Died January 31, 1940. Aged 64.

O. E. Heimark, Duluth. Born 1873. Hamline University 1899. Died July 17, 1939. Aged 66.

A. C. Jacobs, Elmore. Born 1852. Minnesota Hospital College 1886. Died June 28, 1939. Aged 87.

Benjamin W. Kelly, Aitkin. Born 1874. University of Michigan 1897. Died June 4, 1939. Aged 65.

Charles A. Lapierre, Minneapolis. Born 1870. Laval University 1892. Died June 29, 1939. Aged 69.

William J. Mayo, Rochester. Born 1861. University of Michigan 1883. Died July 28, 1939. Aged 76.

James McCrea, Fulda. Born 1863. McGill University 1894. Died December 19, 1939. Aged 76.

Martha B. Moorhead, Minneapolis. Born 1865. Women's Medical College of Pennsylvania, 1892. Died October 13, 1939. Aged 74.

Howard McI. Morton, Vincentown, N. J. Born 1868. University of Pennsylvania 1891. Died July 19, 1939. Aged 71.

Timothy J. Moynihan, St. Paul. Born 1878. Minneapolis College of Physicians and Surgeons 1906. Died March 8, 1940. Aged 62.

Fred H. Neher, St. Paul. Born 1891. Marquette University 1915. Died December 6, 1939. Aged 48.

Leonard J. Nilles, Rollingstone. Born 1902. University of Minnesota 1936. Died February 2, 1940. Aged 37.

Lida Osburn, Mankato. Born 1875. University of Minnesota 1900. Died March 11, 1940. Aged 65.

Edward L. Paulson, Minneapolis. Born 1883. University of Minnesota 1909. Died October 7, 1939. Aged 56.

Victor Rosseau, Maple Lake. Born 1872. University of Minnesota 1905. Died October 15, 1939. Aged 77.

Jacob C. Rothenburg, Springfield. Born 1860. University of Michigan 1885. Died October 1939. Aged 79.

Fred H. Stangl, St. Cloud. Born 1893. Rush Medical College 1919. Died March 19, 1940. Aged 46.

Eugene S. Strout, Minneapolis. Born 1862. University of Michigan 1891. Died June 25, 1939. Aged 77.

Lincoln A. Sukeforth, Duluth. Bowdoin 1886. Died April 8, 1940.

Theodore Thordarson, Minneota. Born 1865. University of Illinois 1897. Died August 2, 1939. Aged 74.

James A. Watson, Minneapolis. Born 1867. Manitoba Medical College 1895. Died June 17, 1939. Aged 72.

Thomas T. Warham, Minneapolis. Born 1866. Minneapolis College Physicians and Surgeons 1897. Died March 28, 1940. Aged 74.

FORMER MEMBERS

Guy R. Caley, Princeton. Died September 26, 1939.

Charles R. Christenson, Starbuck. Died January 14, 1940.

C. T. Granger, Rochester. Died July 30, 1939.

George A. Kohler, Minneapolis. Died January 8, 1940.

Owen McKeon, St. Paul. Died December 29, 1939.

Dr. W. W. Will: I would like to ask the House of Delegates to stand in memory of the departed. (Delegates stood as requested.)

The House of Delegates will reconvene at the Cafe in the Kahler Hotel tomorrow.

The meeting adjourned.

HOUSE OF DELEGATES

Monday, April 22, 1940

Dr. W. W. Will introduced Dr. H. Z. Giffin, Chairman of the Council.

Dr. H. Z. GIFFIN: I have noticed from time to time that the Speaker of this House has considerable difficulty in getting the House to come to order. It occurred to me the House of Delegates had no gavel and also that we had an artist in wood in our membership, who might be persuaded to make the gavel for us. Accordingly, I approached Dr. Lemon on the matter and Dr. Lemon not only agreed to make a gavel but he worked assiduously at it and he has produced a work of art. I would like to have Dr. Lemon tell you about it. (Dr. Lemon's speech in full is published elsewhere in this issue.—Editor.)

Dr. W. W. Will: Dr. Lemon, on behalf of the Minnesota State Medical Association and this House of Delegates, I accept the gavel with a great deal of pleasure.

Upon being informed that a quorum of certified delegates was present by Chairman E. S. Boleyn of the Credentials Committee, Dr. Will then asked Dr. B. S. Adams of Hibbing to read a telegram from St. Louis (Missouri) Medical Society asking Minnesota delegates to the American Medical Association to vote for St. Louis for the 1943 convention of the Association. The motion was then made and seconded and carried to dispense with the reading of the minutes of the previous meeting.

Dr. W. W. Will: I see, sitting before me, a man before whom I appeared many, many years ago, as a student in fear and trembling. Perhaps the reason that I felt like a little boy in his presence was because he took such a fatherly interest in my class. They tell me he has grown older; I admit that his hair is a little bit grayer though he parts it just as he did all those years ago. He has been a president; he has been a member of the House of Delegates of the American Medical Association; he has done yeoman service in the Editing and Publishing Committee. Someone has said that he has retired. Now ordinarily, I would believe anything that a member of this House of Delegates might say, but when anyone tells me that Dr. J. T. Christison has retired, especially when there is a fight on in the interest of organized medicine, I must ask them to prove it. I am sure that this House of Delegates agrees with me that Dr. Christison has been one of the most valuable members of our Association, and don't ever let anyone tell you that Dr. Christison has retired. He has not; he is here with us today and we will hope that he will stand up at least and take a bow if he is given the opportunity. Perhaps you, yourselves, would like to express your feelings about Dr. Christison.

Dr. C. A. Stewart: Mr. Chairman, I would like to have the privilege of expressing my appreciation and genuine admiration for Dr. Christison. In the year that I was born, 1890, Dr. Christison received the degree of Doctor of Medicine from Long Island College. There is a story connected with his graduation. His final examination included a practical exam-

ination in which he was assigned the sphenoid bone. It is said that he took the bone into the proctor and it is said that the proctor did not recognize the bone and passed him.

In 1895, Dr. Christison became Clinical Professor of Pediatrics at the University of Minnesota and as such, he enjoyed the distinction of being the first Clinical Professor of Pediatrics west of the Mississippi River. It was he who appointed Dr. Walter Ramsey and Dr. Julius Parker Sedgewick to the Department of Pediatrics. And in so doing he became, in truth, the father of Pediatrics in the state of Minnesota.

Dr. Christison has been identified with the Minnesota Medical School for something in excess of forty-seven out of the fifty-one years of its existence. In addition to these statistics, he has been president of this Medical Association; he has also been our delegate to the American Medical Association. And in addition, as it has already been mentioned, the guidance of MINNESOTA MEDICINE has been in his hands for many years. I consider it a pleasure here to be able to announce that an endowment fund derived from the earnings of MINNESOTA MEDICINE has been established. This endowment insures the future of the journal which he has fathered through all these years. This year the fund will receive something in excess of \$1,000. And we may well look upon this endowment as the J. T. Christison Endowment Fund. I thank you.

DR. E. M. HAMMES: Being one of Dr. Christison's old students, and living in his neighborhood, I would like to be allowed to say a few words about him.

I do not understand the Speaker of the House when he says that he approached Dr. Christison (we liked to call him Christy when we were students) with fear and trembling. I think he must have been the only student who ever approached Dr. Christison with fear and trembling. Dr. Christy has many pet babes and among them was the Pediatrics Department of the University of Minnesota, the State Medical Association, the American Medical Association and last but not least MINNESOTA MEDICINE.

It was in 1916 when the Council first talked about publishing a medical journal. In 1917, the president appointed a committee consisting of Drs. Scofield, Finkler, Hill and Buckley and one other member to consider the report on an offer made by the *St. Paul Medical Journal* to turn over this journal with all its assets to the Minnesota State Medical Association. Through the efforts of Drs. Buckley and Emmett Farr, both of whom are now deceased, and Dr. Christy, the offer was accepted and MINNESOTA MEDICINE was born.

It was in 1919 that Dr. Christy became a member of this committee and for at least the past ten or eleven years he was Chairman of the Committee. Through his untiring efforts, we now have a journal second to none, I believe, in this country.

Dr. Christy has traveled extensively to Europe and South America and I said to him a little while ago: "Christy, what are your hobbies now?" He replied, "My hobbies are to see America last."

Of all the members of the medical faculty of the University, Christy was not only one of the most popular among the medical students—I do not know if Christy knows that or not, although it is true, but the friendship and affection which began in those days has continued and grown throughout the years, and we, his own students, still hold him in high esteem.

Dr. Christy, we want you to come here regularly for our meetings, every year for years to come. We still need your counsel and we still need your advice.

DR. W. H. AURAND: Mr. Speaker, there aren't many members of the old class of 1901 here, but I happen

to be one of them. We thought so much of Dr. Christison in those days, that we made him a member of our class of 1901.

DR. L. L. SOGGE: Sometimes we admire a tree because it produces beautiful flowers, and sometimes because it produces fruit. Those among us who attended Dr. Christy's classes feel that he was a flower to us medical men and that he produced fruit that we have enjoyed as long as we have known him.

I was a farmer boy when I went into his classes. Some of us were pretty discouraged at times; we thought it an almost impossible task to go through and complete the course, but I remember as plainly as if it were yesterday how Christy encouraged me. He is one of the men who helped me to get the courage to go through medical school and I shall never forget him.

DR. WILL: I am sure that there are many more of you who would like to express your thoughts in regard to Dr. Christy. I think, however, that I ought to offer a word of explanation as to why the fear and trembling. I, too, was a farmer boy, and Dr. Christy was a very distinguished looking man; he has never gotten over it either. He was like a father to us, too, but stand me up alongside of him now and you couldn't tell which was the father. Dr. Christy would say, "It's the way you live, of course." I think we ought to give you a little chance to say a word for yourself, Dr. Christy.

DR. J. T. CHRISTISON: Mr. Speaker and Gentlemen of the House: Just give me a minute to get the lump out of my throat.

I received, when I returned home a few days ago, a letter from that imp, couched in such terms that I could not resist the temptation to come to this meeting. It never occurred to me that you were going to put up a job like this on me. I was going to say that it is downright cruelty because "there ain't any such thing."

It is true enough that I probably passed a lot of you fellows when I shouldn't have done it; but at the same time, you were all boys to me and you always will be. Some years ago, at a meeting of this Association in Minneapolis, I took the liberty of saying that the members of the State Medical Association of Minnesota were, individually, the finest lot of men I have ever known, but collectively, you weren't worth a damn.

Since that time, many things have happened.

We had under consideration, at that time, the plan of selling the State Society to the County Societies and our dear, beloved friend, Herman Johnson, was the sponsor of the movement. He enlisted the services of Dr. Savage, Dr. Sogge, myself and some others, and I think, between us, we put it over. So that today, Minnesota is recognized by the American Medical Association as one of the outstanding subordinate societies in its entire membership. The little things that I have done I regard as simply my duty.

When I first entered the teaching service of the Medical College, it wasn't much of a school to tell the truth. But the students were earnest, hardworking boys, and they deserved what they got.

Speaking of Herman Johnson, I remember an examination I gave to the class of 1901, of which he was a member. I wrote the question on the board and told the boys I was going over to smoke a pipe with Westbrook. They might write until they got tired and I would be back in an hour and a half. When I came back, there was only one man in the room. He was on the top row in the benches in Millard Hall, writing away for dear life. I tiptoed up and looked over his shoulder; he had about seven or eight pages of foolscap closely written. I said to him, "Herman,

(I knew most of the boys then, you know, by their first name), what on earth are you doing?" So intent had he been on his writing that he jumped when I spoke to him. "I'm trying to complete this examination because getting through medical school means a lot to me," he said. "Herman," I said, "let me see what you have got there."

He handed me the sheaf of papers and I looked at them. "Well, Herman," I said, "I don't know if you are trying to write a book, or what you are trying to do, but if you expect me to read all that stuff, you are jolly well mistaken." I took the test, and folded it up, marked "B" on it, and handed it back.

This comprehensive business that they have now at the end of the year did not appeal to us fellows at all. After we had had a group for six weeks, we knew who was going to pass and who wasn't. We interrogated them as we went along, and we found out if they were getting any good out of our lectures and whether the clinics, which we were giving them, were bearing fruit. And perhaps you got what you deserved after all.

Perhaps if I had known what was contemplated, I might have skipped out; but no one, I am sure, could appreciate more than I, the kindly feelings that prompted these remarks, and from the bottom of my heart, I thank you.

Dr. W. W. WILL: I am going to depart from the usual proceedings and call at this time for election of officers.

The Speaker then called for nominations for the office of President-elect.

Dr. B. J. Branton of Willmar was nominated for the position of *president-elect* by Dr. S. A. Slater of Worthington. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary cast a unanimous ballot for Dr. B. J. Branton for the office of President-elect.

In response to a request from the Speaker, Dr. Branton acknowledged his election to the position of president-elect and recalled that he had graduated from medical school with Dr. Sogge and Dr. Will and many others who were present among the delegates. He hoped to be able to follow worthily in their footsteps as president of the Minnesota State Medical Association. He declared that to be elected president by colleagues in the same profession is the greatest honor that could come to any man in a lifetime. He thanked the delegates from the bottom of his heart and expressed the hope that he would be able to measure up to the men who preceded him in office. He foresaw pitfalls for medicine in 1941 and bespoke the coöperation of all to avoid them and to maintain the high standards of medicine in Minnesota.

Dr. Albert Fritsche of New Ulm was nominated for the position of *first vice president* and there being no further nominations, it was moved, seconded and carried that the nominations be closed, and the secretary be instructed to cast the unanimous ballot for Dr. Fritsche for first vice president.

Dr. F. J. Heck of Rochester was nominated for the position of *second vice president*, and there being no further nominations, it was moved, seconded and carried that the nominations be closed, and the secretary be instructed to cast the unanimous ballot for Dr. Heck for second vice president.

Dr. B. B. Souster of St. Paul was nominated to succeed himself as *secretary*, and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the president be

instructed to cast the unanimous ballot for Dr. Souster for secretary.

Dr. W. H. Condit of Minneapolis was nominated to succeed himself for the position of *treasurer*, and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the president be instructed to cast the unanimous ballot for Dr. Condit as treasurer.

Dr. W. W. Will of Bertha was nominated to succeed himself as *Speaker of the House of Delegates*. Dr. E. A. Meyerding, vice speaker, was asked by Speaker Will to take the chair. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Dr. Will to succeed himself as Speaker of the House of Delegates.

Dr. Will resumed the chair and Dr. E. A. Meyerding of St. Paul was nominated to succeed himself for the position of *vice speaker*. It was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Dr. Meyerding for vice speaker.

Dr. Carl M. Johnson of Dawson was nominated as *Councilor of the Third District* to succeed Dr. B. J. Branton, previously elected to the position of President-elect, and it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Dr. Johnson as Councilor of the Third District.

Dr. E. M. Jones of St. Paul was nominated to succeed himself as *Councilor of the Fifth District*. There being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Dr. Jones as Councilor of the Fifth District.

Dr. E. J. Simons of Swanville was nominated to succeed himself as *Councilor of the Seventh District*. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Dr. Simons as Councilor of the Seventh District.

Dr. W. A. Coventry of Duluth and Dr. W. F. Braasch of Rochester were nominated to succeed themselves as *Delegates to the American Medical Association* with Dr. J. C. Hultkrans of Minneapolis and Dr. W. L. Burnap of Fergus Falls as *Alternates*. There being no further nominations for any of these offices, it was moved, seconded and carried that the nominations be closed and that the Secretary cast a unanimous ballot for these four men as Delegates and Alternates to the American Medical Association.

Dr. W. W. Will then called for Dr. T. B. Magath to present a resolution to the House of Delegates.

Dr. T. B. MAGATH: I am speaking not as a member of the State Board of Health but as Chairman of the Executive Committee of the American Society of Clinical Pathologists, and a member of the organization of Pathologists of this state.

For many years, the Pathologists have been cognizant of the fact that the entering wedge in Corporate and State Medical Practice was through their specialty. Three problems have confronted us through these years. One is the practice of laboratory medicine by lay-groups, which came to a head in Pennsylvania this year when the court decided that the practice of laboratory medicine was the practice of medicine and that in

order to practice medicine in Pennsylvania, you had to have a license.

The second is the practice of pathology, and anesthesia, and radiology by the hospitals. We have maintained that the hospitals have no right to practice medicine. They therefore have no right to practice radiology, pathology, and anesthesia, or any other specialties of medicine.

The third is the State Board of Health situation, which is not very serious in this state, but which has reached enormous proportions in many other states. As a matter of fact, even in this state, there are no private practitioners of pathology who get their living by the practice of pathology alone. Through Federal grants in aid, the Federal Government is able to dictate to State Departments of Health how funds shall be spent, and there have been many federal grants in aid to state laboratories. The only way to avoid such dictation is to refuse to receive the money. As a matter of fact, three states have refused to receive federal money in certain maternal welfare programs and in certain other situations. But because their funds are so large in proportion to state funds, it has been impossible for state laboratories or state boards of health to refuse them in the majority of cases for perfectly obvious reasons.

The situation thus created is extremely critical for the practice of clinical laboratory medicine. We are faced with a kind of parting of the ways. If the situation is to continue, there will be no practice of pathology as such, and one has only to cite the fact that at the present time, there are from eight to ten jobs open for one pathologist who is able to take them. To show how serious the situation is, naturally young men will not go into pathology unless there is a possibility of remuneration in private practice in that particular field.

As pathologists, we feel that if this tendency continues, and if this is to be the order of the day, there is no reason why State Boards of Health or other state or municipal organizations may not practice any form of medicine. We see, according to newspaper accounts, that Surgeon General Parran has advocated that future diagnosis in cancer must be made available free of charge to anyone who wants it. Why he has not said that the operation for the removal of the cancer should be free I cannot understand.

In any case, pathologists feel that it is time now to have on record some resolution by the American Medical Association, pointing out the principle on which pathology should be practiced by State Boards of Health. It should be said in the beginning that there is absolutely no contention on the part of any pathologist that the State Board of Health should not control communicable disease in any way that it sees fit. That is the prerogative of the Board and must not be interfered with by anyone.

They do not believe, however, that the state laboratory has any right to do laboratory medicine for people who are able to pay for it. And that is the only principle on which we base this resolution. We believe that the same policy applies to all branches of medicine and that it is fundamental to the practice of medical arts as we know it today.

It may interest you to know that there are probably less than one thousand pathologists in the United States qualified to practice pathology today. The situation has been presented to the Board of Trustees of the American Medical Association, and the Trustees have suggested that we return to our several states and present to them resolutions of the character of the resolution which I am about to read you now. Similar resolutions will be presented to other state medical societies throughout the United States.

"WHEREAS the continued growth and development of that branch of medicine known as clinical pathology is necessary for the proper diagnosis and treatment of the sick and is essential to the science of medicine; and

"WHEREAS the natural growth of laboratories of state boards of health has been greatly augmented by grants-in-aid from the federal government; and

"WHEREAS the effect of these grants-in-aids is to extend these services to all citizens without regard to their ability to pay; and

"WHEREAS the excessive development of laboratory medicine by state boards of health serves as an entering wedge for state medical practice which apparently will include all medical specialties; and

"WHEREAS these tendencies result in the curtailment of the private practice of clinical pathology, which practice is essential for the continued growth and development of clinical pathology;

"BE IT THEREFORE RESOLVED that the House of Delegates of the State Medical Society recommends to the authorities of the State Board of Health that they consider limiting the services offered by the laboratories of the Board. In general, laboratory services by the State Board of Health Laboratories should be confined to requests made by health officers or others in authority representing municipal, township, county and state organizations, and requests from physicians whose patients find it difficult or impossible to pay the cost of laboratory services of this kind in the usual and customary manner. In general, laboratories of the State Board of Health should not provide services at the tax payers' expense to persons who are able to provide for themselves."

I should like to say in conclusion that the State Board of Health in Minnesota does not extend its services to clinical pathology and into other such services. It has confined itself rather generally to the control of communicable diseases. However, it is time that somebody in authority took the position that certain principles must be adhered to in the practice of medicine, and these principles apply to all specialties.

At this time Dr. W. W. Will called upon Dr. H. Z. Giffin, Chairman of the Council, to present a report of the day's Council meeting.

DR. H. Z. GIFFIN: The resolution just presented by Dr. Magath was considered by the Council today and approved and referred to the House of Delegates for action. The Council met with the State Board of Health this morning and several matters discussed were referred to the various committees and need not be presented at this time to the House of Delegates.

One other matter, that of the resolution sent by the Oregon State Medical Society, concerning the exhibit of the Mayo Foundation at the Fair in San Francisco and also the story and pictures about the Mayo Clinic which appeared in *Life* magazine, was considered by a committee of the Council consisting of Dr. Jones, Dr. Elias, Dr. Sogge, and Dr. Earl, who have presented a report and formulated a letter which received the unanimous approval of the Council this morning, and which will be referred at this meeting to the House of Delegates.

Other matters that were considered this morning need not, I believe, be referred to the House of Delegates.

Dr. J. P. McDowell inquired if the resolution involved in any way the question of nurses giving anesthetics in hospitals, and Dr. P. C. Leck of Austin asked if the resolution affected in any way the present practice of the State Board of Health in the matter of Wassermann tests.

DR. T. B. MAGATH: As you probably notice, the resolution is couched in the most general terms. As I said, the immediate effect in this state will certainly be nil because at the present time, this state has no laboratory that is set up on the basis of giving free laboratory tests to all.

If the principle is enunciated, however, we are hoping and expecting that ultimately young men who will practice pathology will come into this state. I am quite familiar with all of the obvious arguments and objections to this plan, not the least of which is that Wassermanns may be done in large quantities in a central place, done well and done efficiently. That is only one side of the argument.

We are maintaining that a pathologist is still a useful animal and that if he is around, he will do other things besides Wassermanns. If he can't make a living by doing Pathology, he won't be in Pathology, and you won't have any Pathologists. That is all there is to the whole problem.

It was moved, seconded and carried that the resolution be approved. At the request of the Speaker of the House, Dr. D. P. Head read the following resolutions which were approved by the Committee on Resolutions, and presented for action by the House of Delegates.

RESOLUTION ON THE STATE BOARD OF HEALTH

WHEREAS the State Board of Health and its secretary and executive officer, Dr. A. J. Chesley, have consistently worked with the Council of the Minnesota State Medical Association, not only in carrying out all branches of their established program, but in the inauguration of new activities made possible by federal appropriation; and

WHEREAS they have made invaluable contributions to the program of this association including the important statistical studies prepared especially for our monthly packets, and

WHEREAS they have used a considerable portion of federal funds allotted to Minnesota for the postgraduate education of our members out in the field and at the Center for Continuation Study on the University Campus,

BE IT THEREFORE RESOLVED that this House of Delegates express its deep appreciation to Dr. Chesley and his associates both for his cooperation in matters of policy and for his aid to our program and members, and

BE IT FURTHER RESOLVED that this House commends the Board and Dr. Chesley and their aids for their outstanding achievements in public health in Minnesota.

* * *

The courtesy extended our members and guests and the fine accommodations provided by the Rochester hotels, have greatly added to the comfort and enjoyment of all who attended this outstanding meeting. The House of Delegates extends its thanks and appreciation to managements and staffs of all of these institutions and to the people of Rochester who cooperated with them in providing added accommodations for guests.

* * *

Five distinguished out of state speakers have appeared before this convention through the courtesy of the following special societies: Minnesota Society of Internal Medicine, Northwestern Pediatric Society, Minnesota Radiological Society, Trudeau Society and the Northern Minnesota Medical Association.

In sponsoring these speakers the special societies have made inestimable contribution to our meetings which is gratefully acknowledged by this House.

* * *

Most of the credit for the fine arrangements made for this meeting goes to our host society, the Olmsted-Houston-Fillmore-Dodge County Medical Society and its active local arrangements committee under the chairmanship of Dr. F. J. Heck. To Dr. Heck and his committee and to every member of the Society, the House of Delegates in session here expresses its warm appreciation and gratitude.

* * *

WHEREAS a new policy by which the advice of physicians is sought by the Division of Social Welfare at each step in the re-organization of welfare work in the state, wherever medical care is involved; and

WHEREAS by this policy medical care of the needy is now being established on a better basis than ever before in the state; and

WHEREAS this new policy has been put into effect by Mr. Walter Finke, Director of the Division, and Dr. H. E. Hilleboe, Medical Coordinator, and their aids, he it therefore

RESOLVED that this House of Delegates profoundly appreciates the sympathetic cooperation of Mr. Finke and his associates and endorses his plan of close cooperation between physicians and welfare workers to the end that the welfare clients may have the best possible medical care in Minnesota.

BE IT ALSO RESOLVED that this House of Delegates offers Mr. Finke and his aids the fullest cooperation and support.

* * *

The House of Delegates wishes to express its obligation to the *Rochester Post Bulletin* and to the *Minneapolis, St. Paul and Duluth* papers including the *Minneapolis Star Journal*, *The Minneapolis Times Tribune*, *The St. Paul Dispatch* and *Pioneer Press*, and the *Duluth Herald and News Tribune* for their excellent reporting and treatment of scientific sessions held in connection with the meeting of the Minnesota State Medical Association at Rochester and for their generous contribution of space to advance announcements. The importance of accurate reporting of medical news is well recognized by the members of this House and the cooperation of these newspapers is thoroughly appreciated.

* * *

Radio time for three statewide broadcasts by distinguished guest speakers was generously provided by KROC, KSTP and affiliated stations of the Minnesota network. These broadcasts contributed much to the interest and value of the meeting of the Minnesota State Medical Association at Rochester and the warm thanks of the House of Delegates to stations KROC, KSTP and associates is hereby extended.

The grateful appreciation of this House is accordingly extended to every member of the Clinic Staff for the fine entertainment in which the Clinic acted with the Olmsted-Houston-Fillmore-Dodge County Medical Society as host, for their courtesy and helpfulness in every detail of this meeting and especially for their kindness in opening their homes to convention visitors who were unable to secure reservations in the hotels.

* * *

The Speaker then called for discussion of these resolutions.

Dr. C. R. DRAKE (Minneapolis): I second the resolution concerning Dr. Chesley most heartily. Last time I saw Dr. Chesley, outside this meeting, was down in St. Louis at a meeting of the National Association of Administrators of Schools. School people have many ideas about health; some of them good and some are poor; some of them are ridiculous. However, Dr. Chesley was on the job and I feel that our group put up the best argument all along the line. As a result of Dr. Chesley's work, I feel sure the organization will be guided largely by the medical profession.

It was moved, seconded and carried that the resolution be accepted.

The Speaker then called for the report of the Special Committee of which Dr. E. M. Jones of St. Paul was Chairman.

DR. E. M. JONES:

We have carefully reviewed the report of the Reference Committee on Executive Session of the Oregon State Medical Society pertaining to two matters of so-called "MAYO CLINIC PUBLICITY" and which report was forwarded to the Council of the Minnesota State Medical Association by Morris L. Bridgeman, M.D., Secretary of the Oregon State Medical Society, and, by Olin West, M.D., Secretary and General Manager of the American Medical Association.

The first of these two matters concerns certain alleged publicity regarding the Mayo Clinic and Mayo Foundation scientific exhibit at the San Francisco Fair in 1939, it being the claim of the House of Delegates of the Oregon State Medical Society that the exhibit "while ostensibly of a scientific character, is presented in such form as to make it a means of attracting patronage and hence commercial in nature."

We beg to most respectfully report that we have very carefully examined the facts and circumstances leading up to the participation by the Mayo Clinic and the Mayo Foundation in this scientific exhibit and we find the facts to be undisputed that the Mayo Clinic and the Mayo Foundation received numerous and repeated requests to assist in the presentation of such scientific exhibit at that Fair from members and officers of the California State Medical Society; that these requests were rejected by the Mayo Clinic and the Mayo Foundation; that following repeated renewal of such request the Mayo Clinic and the Mayo Foundation out of courtesy to those making the request reconsidered the matter and after discussing it with members and officers of the California State Medical Society and others, agreed to participate in such scientific exhibit provided that the exhibit first met with the approval of the members of the California State Medical Society with the distinct understanding that the exhibit would be maintained at the Fair only during 1939; that upon termination of the Fair, and before any decision was reached as to whether or not the Fair would reopen in 1940, this scientific exhibit was ordered dismantled by the Mayo Clinic and the Mayo Foundation and returned in spite of repeated requests to have it remain during the Fair in 1940.

This committee is thoroughly convinced that this exhibit was purely of a scientific nature and that the Mayo Clinic and the Mayo Foundation were actuated solely by a desire to present such scientific exhibit in acquiescence to the repeated requests from persons of high repute and standing in the profession of medicine in the State of California and who had no interest in the Mayo Clinic or in the Mayo Foundation and who were not motivated by any desire of attracting patronage to the Mayo Clinic or the Mayo Foundation, and who were interested solely in having at the California Fair a high type of scientific exhibit in the field of medicine that would interest visitors to the Fair.

Consequently, this committee is convinced following careful examination of the facts, including correspondence and telegrams in reference to the exhibit, that the exhibit was neither commercial in nature nor was the Mayo Clinic or the Mayo Foundation motivated by anything except the highest ideals and principles underlying the practice of medicine in their participation in this exhibit.

This Committee most respectfully wishes to inform the Council that it has carefully considered the second matter referred to by the House of Delegates of the Oregon State Medical Society concerning the Mayo Clinic and the Mayo Foundation, to-wit, the claimed impropriety of an article that appeared in *Life* magazine for September 4, 1939. It is the position of the House of Delegates of the Oregon State Medical Society that this article which makes reference to a

specified number of physicians on the staff of the Mayo Clinic and also makes reference to the alleged number of patients who register in one day at the Mayo Clinic and claimed approximate number of operations performed in one year by members of the staff of the Mayo Clinic is improper, it being claimed that the article in question "is generously illustrated with various photographs and charts outlining the organization and operation of the Clinic and Foundation," and the conclusion on the part of the House of Delegates of the Oregon State Medical Society that the "obvious effect of this type of publicity in a lay publication is to attract patients," and the further expression of opinion on their part that "publicity of these types has obvious commercial implications and is not in the best interests of the medical profession and is to be condemned," the recommendation of the House of Delegates of the Oregon State Medical Society being "that this publicity of the Mayo Clinic and the Mayo Foundation be called to the attention of the American Medical Association and all the constituent state medical associations. . . , the inference being that this so-called publicity was inspired and approved by the Mayo Clinic and the Mayo Foundation.

Your committee has made a most painstaking examination of the facts leading up to the publication of the article referred to in *Life* magazine and we find that the evidence is overwhelming; that this article was neither inspired nor approved by the Mayo Clinic or the Mayo Foundation. In fact, the facts show that the Mayo Clinic and the Mayo Foundation at no time furnished *Life* magazine nor any one connected with that magazine directly or indirectly, with any material or with any pictures to be used in such an article and furthermore, upon learning the *Life* magazine intended to publish such an article, immediately conferred with the officers of the Minnesota State Medical Association and with a number of officers and trustees of the American Medical Association and in addition sought legal advice to determine if there was not some way in which the Mayo Clinic and the Mayo Foundation could dissuade or stop through legal means, the publication of any such article. It was then discovered that no amount of persuasion would deter *Life* magazine from obtaining such an article and it was also learned that no legal steps could be taken to enjoin *Life* magazine from publishing such material, correct or otherwise, as they had been able to gather through their own employees.

The facts disclose that a number of the pictures are outdoor pictures, candid snapshots taken in the lobby and in the halls together with sketches that were made by employees of *Life* magazine showing diagrammatic outline of the floor plan, the responsibility for which can in no manner be attributed to the Mayo Clinic or the Mayo Foundation.

It is quite apparent from the article itself and the pictures that were published that it is a simple matter for any publication, magazine or otherwise, to obtain such information and views without the consent or even the knowledge of the Mayo Clinic, the Mayo Foundation or any one else in the practice of medicine similarly situated.

Your committee believes that the medical profession of the State of Minnesota would be the first ones to criticize and publicly condemn any professional impropriety, either by way of misconduct or publicity motivated through any selfish desires. We also believe that careful examination of the facts in respect to both of these matters clearly demonstrates the lack of merit in the position taken by the House of Delegates of the Oregon State Medical Society and also indicates conclusively their lack of knowledge of the true facts.

The Mayo Clinic in presenting their case invite suggestions from any state or national medical organization to assist them in avoiding any future similar occurrences.

In conclusion your committee would recommend to the Council and to the House of Delegates that they have reviewed the facts pertaining to the resolution presented by the House of Delegates of the Oregon State Medical Society in reference to both these matters and find that the facts themselves refute the position taken by the House of Delegates of the Oregon State Medical Society and clearly show no improper motive whatsoever in respect to the scientific exhibit at the California Fair, and, also show that the article that appeared in *Life* magazine was neither inspired nor approved by the Mayo Clinic or the Mayo Foundation and the publication of any article was disapproved of by them in advance of its publication; that this committee is not unmindful of the contribution made by the Mayo Foundation to the education and training of physicians and surgeons who practice throughout the world and to the specific benefit that accrues to the State of Minnesota and the University of Minnesota by virtue of the Mayo Foundation and we would most respectfully recommend that suitable action be taken by the Council and by the House of Delegates of this Society setting forth the opinion of both such bodies in reference to this matter and that copies thereof be furnished the Oregon State Medical Society, the American Medical Association and any other constituent state medical association that was the recipient of the report of the House of Delegates of the Oregon State Medical Society in reference to this matter.

DR. W. W. WILL: Thank you, Dr. Jones. I hope that we may have more discussion of this matter. First of all, I would like to ask Mr. Harwick, Secretary of the Board of Governors of the Mayo Clinic, to say a few words.

MR. H. J. HARWICK: Mr. Speaker, Gentlemen: I have quite a complete file here and I'll try to condense it, taking the *Life* matter first.

In May, 1938, Miss Dorothy Larson, representing *Life*, came to the Clinic and requested permission to publish a pictorial story regarding the Clinic. At that time she was seen by Dr. Balfour and myself, and we persuaded her not to proceed. She, at that time, brought up the question of a series of picture articles, picture stories, of medical centers throughout the United States. We gave her no assurance of our participation in that but referred her to the officers of the American Medical Association. She told me at that time that she was going to see Dr. Fishbein. I attended the meeting of the American Medical Association in San Francisco in June, 1938, and happened to be on the same train with Dr. Fishbein; I discussed this matter fully with him, and he agreed to follow it through with Miss Larson when he got out in San Francisco.

We heard no more about the matter until September, 1938, when Dr. Balfour received a request directly from the publisher of *Life*, Mr. Roy Larson, no relation to Miss Larson, again requesting permission to publish this story. To this Dr. Balfour replied as follows:—"I'll skip part of it here—"We appreciate the compliment entailed in wishing us to do this, and know that your staff would set out to prepare something which would avoid as much as possible any criticism; but we have always endeavored to adhere to what the medical profession believes to be the fundamental principles of the practice of medicine, and we would feel that regardless of how such a story is pictured we would be placed in a false position.

"In spite of the fact that you have published pictorial stories of scientific institutions which you mentioned in your letter, the primary function of the Mayo Clinic is the care of the sick and since these patients are, to a large extent, private patients, we strive to live up to those principles governing their care. We hope you will see our position in the matter, etc."

Then he adds: "If in the future, the American Medical Association should desire to cooperate with you in the preparation of an article in which we might be of assistance, we would be glad to give it consideration."

We heard no more of that; that was in September. We heard no more until July, 1939, when Miss Larson appeared in Rochester without advance notice and told us, Dr. Balfour, and myself, she had been sent by the editorial board of *Life* to get a story, the photographers were on their way and that her instructions were to proceed with the story regardless of our opposition. Dr. Balfour, Dr. Mussey, Chairman of our Board of Governors, and myself had no success in attempting to persuade her that the article should not be done. We were very definite in stating to her that we would not grant permission for pictures inside the Clinic.

It was then decided to seek the advice of the Minnesota State Medical Association and the American Medical Association. Accordingly, Dr. Giffin of the Clinic Staff, Chairman of the Council of the State Society; Dr. Braasch, a delegate from Minnesota to the A.M.A., asked Dr. Earl, President of the State Society; Dr. Savage, Delegate to the A.M.A., and Dr. C. B. Wright of Minneapolis, Member of the Board of Trustees, to come to Rochester for a conference, which they very graciously agreed to do. Dr. Balfour also communicated with Dr. Fishbein by telephone. We pointed out that we could not prevent *Life* from publishing the story on Rochester and including photographs of the outside of the Clinic. He emphatically advised against giving permission to take pictures inside the Clinic. Dr. Fishbein also said he would see the Editors of *Life* about the middle of August and would present to them the viewpoint of the medical profession and of the Clinic.

He communicated immediately with one of the higher officials of *Life* who later telephoned Dr. Balfour and also telephoned me again asking permission to proceed with the story and pictures. He was definitely told by both of us that this could not be done. Dr. Wright, Dr. Earl and Dr. Savage and Dr. Henderson of Louisville, another member of the Board of Trustees of the A.M.A., who happened to be in Rochester at the time, had dinner with Miss Larson and discussed the matter at length. Following that meeting Dr. Braasch, Dr. Giffin and myself, met with them and with Miss Larson. These gentlemen had expressed themselves as seeing no objection, if *Life* planned a series of articles regarding medical institutions of this kind, to the Clinic's being portrayed as one of such institutions.

The result of this conference was presented to the Board of Governors of our Clinic on Wednesday, July 26. By the way, Miss Larson was present at that meeting; we asked her to be there; after discussion, the Board unanimously decided that the Clinic could not give permission for, nor sponsor such publicity. It was further decided that a disclaimer, denying any responsibility for any article that appeared in *Life* should be prepared; and I wrote Mr. Larson, the publisher of *Life*, as follows: "After several conferences with Miss Dorothy Larson, the officers of the State Medical Association, and after communicating with Dr. Fishbein of the American Medical Association, and two trustees, Dr. Wright of Minneapolis and Dr. Henderson of Louisville, the Board of Governors of the Clinic met today and reviewed with Miss Larson the entire situation. It was the unanimous opinion of the Board that we could not authorize a story on the Mayo Clinic nor pictures to be taken within the Clinic. Since the purpose of such a plan would be entirely contrary to our ideals of how a medical practice should be conducted and not in accordance with the ideals of the medical profession, since we cannot give approval, we hope some way can be found to make our position in this matter clear, should you not respect our wishes in this as you have so courteously done in the past."

To this letter, Mr. Larson replied as follows, and this is a gem: "Thank you for your kind letter of July 26th. We are indeed distressed that the Board of Governors of the Mayo Clinic were unable to cooperate with us in producing what we hope will be a very fine essay on one of the great medical centers of the world. If and when we use the pictures of Rochester as a medical city, we shall certainly attempt to make it clear to the reader that the story was neither sponsored nor sanctioned by your Board of Governors." Now that was not done. This last sentence is a gem, too. "I hope that the day will come when *Life* and the Mayo Clinic can work together in promoting the interests of medicine." (Laughter.)

We then wrote and thanked these gentlemen that so kindly came down. We didn't know when they left that the article was going to come out; we didn't know it until the day before it appeared. I think, Dr. Giffin, that you acquainted the Council at different times with what was going on, did you not?

Now our file in connection with the Exposition is not so complete. I have to rely on memory for part of it. As I recall, first in 1937, certain members of our staff received letters from various officers of the California State Medical Society, inquiring as to whether we would be willing to show an exhibit on clinical medicine at the California Exposition. The matter was brought up to our Board of Governors, and we felt that we had better not participate. We didn't know what the Fair was going to be; we didn't know much about the scientific exhibits that were going to be out there. We had had the exhibit at Chicago which had been a good deal of grief and a heavy expense to us, and we didn't feel that we wanted to go ahead. The pressure kept getting harder and hard-

er. Finally the retiring president of the association called Dr. W. J. Mayo and told him that the members of the California Association were very much interested in having this exhibit, that they were having difficulty getting any clinical institution out there to exhibit, that they felt it would be unfortunate if the Exposition went on without some exhibit of clinical medicine, that we were the only people that they could see in the country who might be willing and able to do it, and that they felt it was our duty to medicine to put it on. Dr. Will agreed to do it. However, we did not sign the contracts; the thing dawdled along until, I think it was April or May of 1938, and meanwhile we had consulted with the people of the American Medical Association in Chicago and had explained the thing to them. They had told us that they could see no reason why we should not exhibit; in fact, they rather urged us to do so and arranged so that our space would be adjacent to theirs.

The American College of Surgeons were also going to exhibit, but in April or May—I don't recall the exact time—they decided not to exhibit. Meanwhile, we had not signed any contract; so I went to San Francisco, and I talked with the man who was President of the American College of Surgeons. He told me the reason they had decided not to exhibit. First, that they didn't have the funds on hand to use for that purpose; and greater than that, they couldn't find anyone in their organization who was willing to go to the grief and trouble of preparing an exhibit. He said that there was nothing in their decision involving the ethical position. They felt it was perfectly sound, and that they could see no reason why we shouldn't exhibit; in fact, he expressed himself as being sorry that the American College was not going to exhibit. I talked to him about the gentleman who had been delegated by the State Society as the Scientific Director, Dr. Silverman, and he spoke of him in the very highest terms, stating that he would feel perfectly confident of anything that this man proposed to put on as an exhibit. I then consulted another old friend of ours out there, Past President of the American Medical Association and a Past President of the State Society and a member of one of their important committees, and he said very much the same thing in stronger terms. He very much urged us to exhibit, and he spoke in the highest terms of Dr. Silverman, the Director of the Exhibits; he made this comment, however: "If you do exhibit, I hope you don't put it up in too high faluting a way." He said, "I think you should put up an exhibit of clinical medicine in a way that lay public can understand. If you put a lot of charts and other scientific things, the public won't be interested and it will be of no instructive value."

We discussed the exhibits of the University of California and Stanford University which were in the same corridor, and he strongly urged us to exhibit. We, Dr. Mussey and I, went all over the building, then half completed, and found where our space was going to be, got a diagram and a story of what the other exhibits were going to be there. Meanwhile at the A.M.A. meeting we talked with many members of the California Society and members of the American Medical Society from other states and almost without exception they urged us to participate. We finally signed a contract in November, I think—and the Fair was to open in February. As Dr. Jones mentioned, we made it clear that we would not exhibit more than one year, that we would not come in for the second year. We did not. We dismantled our exhibit and had it sent home, and in January we received a telegram from the Secretary of the California State Society urging very strongly that we continue our exhibit for 1940; we have also had several telegrams and letters from the Director of the Public Health Service in California since then urging us to exhibit in 1940. But we have not done so, and do not intend

to do so. I think that in a rough way covers it. (Applause.)

It was moved and seconded that the House of Delegates adopt the resolution as read by Dr. Jones. Carried.

Dr. Will then called for discussion.

DR. GEORGE EARL: Last year in my capacity as an officer of the State Medical Association, I was called to a meeting in Rochester, along with Frank Savage, Delegate to the American Medical Association, and C. B. Wright, Trustee of the American Medical Association, to meet Miss Larson, representative of *Life* magazine.

Miss Larson presented the statements that have been given you; namely, that representatives of *Life* magazine had been to Rochester on a former occasion; that they had taken pictures previously; and that they were now ready to go ahead and publish. They had been persuaded to hold up publication for a year, Miss Larson said, but she was of the opinion that the editorial board of *Life* would now release the pictures. They had sent her out to secure more pictures if possible, and as much more information as she could secure. The members of the Clinic, as well as those of us who represented the State Society and the American Medical Association tried to point out to Miss Larson that this would be a difficult matter for organized medicine in Minnesota. We sensed from what she said that *Life* magazine would go ahead anyway so then we tried to compromise and suggested that she begin with a series of articles reflecting the beginnings of American medicine; that she start first with Philadelphia, go on to Boston, New York, Baltimore, Chicago, taking in Rochester, of course, since it would have to be taken in any review of American medicine, and going on to the coast, giving in this matter a cross section of the history of medicine in which the torch was carried ever westward.

Miss Larson promised to present our ideas to the editors of *Life*. We went further; we said that as long as the Mayo Clinic felt as it did about the matter, and they expressed themselves very strongly in our presence as opposing the publishing of pictures in *Life*, would it not be wise if *Life* should publish a Minnesota issue. We suggested that they might relieve the situation considerably by having pictures of the University and possibly other medical developments in Minnesota as well as of the Mayo Clinic.

Miss Larson listened attentively and said that she would present the matter to her employers. We spent an entire evening with Miss Larson and I have never seen more persuasive methods used in trying to prevent publication. No one was more surprised than we were when the article finally came out. We thought that *Life* would surely listen to our representations.

I have given you this account of the occasion because the delegates should have first hand information from someone who was there and who is not connected with the Mayo Clinic.

DR. P. C. LECK, Austin: Mr. Chairman, I also had advance information that this article was to appear in *Life*. I am an independent practitioner in Austin, fifty miles from here. I have no interest in the Mayo Clinic, either to condemn or whitewash their publicity. It is a wonderful place to have close by when you are in a pinch, but sometimes not so good when the patient thinks that he is the only one who is in a pinch.

With that preliminary, I might say that a patient of mine who has been a friend of our family for many years visited in our home last summer, having just returned from a visit to New York City, where her daughter and her daughter's husband are in the newspaper business. A *Life* photographer visited in her daughter's home while she was there and gave quite a story about her efforts in securing pictures and information about the Mayo Clinic. The photographer, a

girl reporter, said that she was having no success whatever in getting permission from the Mayo Clinic; that she had spent a great deal of time there; and that she had finally failed completely to get any cooperation from the Clinic itself. She said that she was going ahead to make what she could out of Rochester. So it was with great interest that I looked at the article that finally appeared in *Life*. And with that forewarning it was very obvious to me that if the Mayo Clinic had been cooperating with the magazine, it would certainly have made a much better job of it.

On this other matter of the Fair, I personally think that the State Medical Association would make a mistake if they went on record favoring that type of exhibit. My personal feeling is that all such exhibits should be shown in the name of the American Medical Association which in turn could secure the cooperation of the Mayo Clinic or any other group in assembling the exhibit material.

At the request of Dr. F. J. Elias of Duluth, Mr. Harwick told the following episode:

MR. HARWICK: This is something that Dr. Olin West called our attention to. Dr. Mussey and I were in Chicago discussing the *Life* matter with him, and this whole question of publicity. We had just been besieged by moving picture people that wanted to make scripts based on the life of Drs. Will and Charlie in the development of the Clinic, and he got to reminiscing about some of the troubles that we had. We have appealed to him so often because it seems that we are down there about every month on some article or another and we manage to kill off about 99 $\frac{99}{100}$ per cent of them, but we do get caught on about $\frac{1}{10}$ of 1 per cent. Dr. West said to me, "You don't need to tell me about your efforts. I recall one instance where the *Chicago Tribune* sent a special feature writer up to Rochester, and he wrote up an article on the Clinic; when he had it completed—he hadn't consulted anybody here—he went in to show it to Dr. Will. Dr. Will read it very carefully and complimented him on the article and then said to him, 'I hope you're not going to publish it.' He outlined the reasons why it should not be published, that it would be unethical and subject us all to criticism and he went to some lengths trying to get this fellow to stop it. Then the writer said that he couldn't do that, that that would be up to his publisher. He had instructions to write the story and he had written it and he was going to turn it in to his publisher. Then Dr. Will wrote Colonel McCormick a letter in which he outlined the reasons he had given this writer for not publishing it, and asked him also to consult with the American Medical Association to verify his viewpoint. He enclosed a blank check signed by himself and Dr. Charlie and told Colonel McCormick to fill it in for whatever amount he thought that the story would bring him by publishing it, and then not publish it."

And Dr. West recalls that Colonel McCormick came into his office in a rage and told him that neither the A.M.A. nor the Mayos or any other man could buy the *Chicago Tribune* and tore the check up. (Laughter.)

DR. E. A. MEYERDING: During my term as Secretary, these things came up frequently. For instance there was the rabies trouble in Minneapolis. A newspaper man, you know, is always looking for something that will attract people's attention. The minute that you try to hide something, he is after you, surmising that where there is smoke, there must be fire, and hoping that somewhere he will get a break. They made use of a break in the rabies business. So far as Minnesota newspapers are concerned, there is only one way I know to handle the situation; that is to have a committee to confer with the editorial association so as to work out some agreement as to what shall and what shall not be published. The newspaperman must have

news and he is going to get it and the minute that you try to conceal something, he is going to look for a nigger in the woodpile.

DR. W. W. WILL: I think Mr. Rosell has had some experience with the Minnesota Editorial Association which might be enlightening to the House of Delegates. Mr. Rosell:

MR. R. R. ROSELL: During the past year we have had several meetings with the representatives of the Editorial Association and have offered our services in every way possible to assist them in getting authentic medical news. Recently we released from our office to every member of the Editorial Association a card to be used in their offices notifying their staff that they could call us long distance, reversing the charges, for authentic medical news and information. A few papers have accepted the offer and have made use of the service; but as Dr. Meyerding said, newspaper men are after a scoop and they will not lay down on the job if the news is available.

I may say that the Committee of the Editorial Association is very friendly to us. Mr. Benshoof, Chairman of that Committee, from Detroit Lakes, has worked with us closely, but if the newspapers are on the track of a really big story, they will get it if possible. The best policy is to give them freely everything that it is possible ethically to give them, and

never to antagonize them by sweeping prohibitions. Whenever we do that, there is a bad situation and it is very difficult to straighten out afterwards.

DR. W. L. BURNAP: I just wanted to say one word; so far as publicity is concerned, it seems to me that Minnesota is very clean. I think that we all agree that our committee has carried on successfully and that the state as a whole is pretty good. Certainly there is nothing very bad about it.

The motion made previously to accept the report of Dr. Jones' Committee was seconded and carried unanimously.

It was moved by Dr. D. P. Heed, seconded and carried, that the House of Delegates instruct the Ethics Committee upon plans to curb all unwarranted publicity in the public press.

DR. W. W. WILL: There is one other matter that must be considered at this meeting; the place of meeting of 1941.

DR. E. M. HAMMES: Mr. Speaker: As Chairman of the delegates from Ramsey County, I extend to you an invitation to hold your meeting for next year in St. Paul. We have the hotels; we have the Auditorium; and if we have the usual good attendance, we'll have a good many doctors in St. Paul.

It was moved, seconded and carried that the 1941 meeting be held in St. Paul. The meeting adjourned.



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PRESENT TRENDS IN THE STUDY OF ARTHRITIS AND RHEUMATISM*

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New York, N. Y.

RHEUMATOID arthritis and rheumatic fever constitute two of the last remaining unsolved problems in the field of the infectious diseases. For this reason they possess exceptional fascination to the investigator, so much so that today a small-sized army of bacteriologists, physiologists and chemists are attempting to dispel the mystery which still surrounds the etiology of these conditions. It must not be inferred, however, that when we call the arthritis problem unsolved we mean to deny the progress which is being made every year in our knowledge and understanding of the disease. If we must admit that the etiology of rheumatoid arthritis and rheumatic fever is still unknown, we may add, in the same breath, that recent investigations are throwing more and more light into this dark corner of medicine and that there is good reason to believe that within another decade, students of rheumatism will have a much clearer conception of the pathogenesis of these two great diseases than we have today.

In the present discussion I propose to touch only the high spots of recent research and will exercise the prerogative of every investigator in dwelling especially on those phases of the problem which have been studied in our own laboratories at the Cornell Medical College.

First let us discuss a very fundamental aspect of the problem, namely terminology and classification. Students of arthritis are beginning to demand more accurate criteria for the identification of the various forms of arthritis. This is particularly so of rheumatoid arthritis,

a disease which has been very much abused so far as terminology is concerned. In the past, vague and desultory joint pains of all kinds have been casually glorified by the designation of rheumatoid arthritis. So many young physicians who have had no training or background in morbid anatomy fail to realize that rheumatoid arthritis is a very definite disease entity, characterized by well defined pathological changes in the joints and in the subcutaneous tissue when nodules are present, and that unless some of the genuine features of the disease are present, the diagnosis of rheumatoid arthritis should never be made. Such carelessness in terminology is particularly unfortunate when clinical reports of some form of therapy are being made. If one includes under rheumatoid arthritis the various arthralgias and psychoneuroses that one sees so frequently in arthritis clinics, the statistical value of the report from the therapeutic standpoint is completely nullified. In my clinic I am constantly being surprised by some of the conditions which are filed under rheumatoid arthritis. For example, osteoarthritis may be mistakenly classified under rheumatoid arthritis, just because the patient shows a high sedimentation rate. The arthralgias of menopause are frequently termed rheumatoid.

The New York City Committee on Arthritis Clinics has been working this winter on a classification of arthritis, and the classification shown in Table I, though provisional, seems to me to be as satisfactory as any.

Briefly I should say that the clinical criteria for the diagnosis of rheumatoid arthritis would be the following:

*Mayo Foundation lecture delivered at the Annual Meeting of the Minnesota State Medical Society, Rochester, Minnesota, April 22, 1940.

(1) Some of the joints must be swollen, and preferably some one or more of the knuckles or the proximal interphalangeal joints of the fingers.

(2) The disease is practically always polyarticular and tends to remain in the joints already involved as it spreads to new joints.

(3) There is a strong tendency to symmetrical distribution of the affected joints. In my opinion the typical fusiform finger is the most characteristic feature of the disease. I always hesitate to make a diagnosis of rheumatoid arthritis when the swelling of the hand and fingers is of a diffuse character.

(4) There is usually evidence of general systemic infection, as indicated by slight fever, anemia, and loss of weight and strength. The vasomotor disturbances are quite characteristic, especially excessive perspiration and rapid wasting of the muscles.

(5) The sedimentation rate of the red cells is practically always increased quite markedly.

(6) The x-ray appearance of the bones and joints is highly characteristic. One of the earliest changes is the osteoporosis of the bones adjacent to the affected joints. As the disease progresses, there is narrowing of the interarticular space and blurring of the whole joint architecture. Small punched-out areas are sometimes seen about the head of the bone adjacent to the affected joint.

(7) The agglutination test with the patient's serum against the streptococcus hemolyticus is positive in 65 to 75 per cent of cases.

(8) In well established cases of several years duration, characteristic ankylosis and deformity of the affected joints renders the diagnosis very simple.

Pathology of Rheumatoid Arthritis.—In 1929 A. G. Timbrell Fisher²³ pointed out certain microscopic features in the synovial membrane in rheumatoid arthritis. He particularly stressed the numerous agglomerations of small round cells which form rounded masses in the region of the blood vessels. In 1931 Allison and Ghormley² published a monograph on arthritis in which they stressed still more strongly the presence of focal collections of lymphoid cells in the synovial membrane. To quote these writers: "Histologically the tissues show a definite picture, which is as clear cut as is that of

tuberculosis, namely a proliferative change in the synovial membrane and marrow which is characterized by focal collections of lymphocytes. This microscopic picture will, we believe, be enough to establish the diagnosis of proliferative (rheumatoid) arthritis." It is true that these collections of lymphoid cells are nearly always present in the synovial membrane of the affected joint in rheumatoid arthritis. Furthermore, in a recent study from our laboratory, in collaboration with Angevine and Rothbard,⁹ we were able to produce an experimental hemolytic streptococcus arthritis in rabbits which presented a picture very similar to that described by Allison and Ghormley. In other words, the same collections of lymphoid cells were found in the synovial membrane of the rabbit as were found in human tissue. However, further experiments showed that a similar picture could be produced in experimental pneumococcus arthritis, and Jordan³² has recently shown that when turpentine is injected into the synovial tissue of rabbits, a lesion can be produced which is indistinguishable from the experimental streptococcal arthritis and quite similar to that seen in human rheumatoid arthritis.

Interesting reports have appeared in recent years on the pathology of subcutaneous nodules in rheumatoid arthritis and rheumatic fever. Here again we encounter peculiar agglomerations of cells about central areas of necrosis which are not seen in any other disease. However, Dawson¹⁷ has shown that the histopathology of the subcutaneous nodule of rheumatoid arthritis differs little, if any, from that of the subcutaneous nodule of rheumatic fever.

Summarizing then, we may say that the synovial membrane and the subcutaneous nodules in rheumatoid arthritis presents interesting and characteristic histological changes, but that these changes are not absolutely specific for rheumatoid arthritis.

Etiology of Rheumatoid Arthritis.—It must be admitted that the theory of focal infection, so popular a few years ago, is very much on the wane in so far as it applies to the etiology of rheumatoid arthritis. The theory of focal infection was first invoked by Frank Billings⁷ as an explanation for the pathogenesis of rheumatoid arthritis. However, if one goes back to Billings' original article and reviews the ten

cases on which his study was based, it is at once evident that some of them today would not be classified as typical rheumatoid cases. Not only Billings, but most of the earlier writers on arthritis, failed to differentiate clearly between infectious and rheumatoid forms. However, the most significant feature of this problem is the fact that while foci of infection were being rapidly disposed of, rheumatoid arthritis remained as prevalent as ever. Two years ago we were so impressed with this fact that Dr. Angevine and I⁸ analyzed 200 cases of rheumatoid arthritis with special reference to the incidence of focal infection. In analyzing these carefully studied cases, we found definite evidence of infection in only 20 per cent of the series, and a questionable focus in 10 per cent. We were surprised to find that 70 per cent of the patients revealed no demonstrable focus of infection. But this was not all. Even when foci of infection were present, their removal seemed to have no permanent beneficial effect on the course of the disease. For example, tonsillectomy had no influence on the disease in eighty-eight cases, and caused a severe exacerbation of the disease in two instances. In no case was the course of the disease arrested or the patient cured. Extraction of the teeth gave no benefit in forty-seven cases, and three patients reported a flare-up of pain in their joints following teeth extraction. The results following drainage of infected sinuses were quite ineffective. As a result of our study, we concluded that internists must exercise a more conservative attitude regarding infected tonsils, sinuses and teeth than they have in the past, and not leave a decision regarding the treatment of these so-called foci to specialists. Evidently the time has arrived for a complete revaluation of the focal infection theory. Focal infection undoubtedly plays an important part in a number of ailments, and we were convinced from our study that there is a type of infectious arthritis, not rheumatoid in character, which is related to focal infection and which is benefited by the removal of infected foci. In this type of arthritis one or more large joints are affected. The patient runs a fever and the picture is not unlike that of rheumatic fever. However, the symptoms do not yield to salicylates and there are no cardiac complications.

TABLE I—CLASSIFICATION OF ARTHRITIS

- I. Infectious Arthritis
 - (a) Of proved etiology.
- II. Probably Infectious; etiology unproved.
 - (a) Arthritis of rheumatic fever.
 - (b) Rheumatoid arthritis (atrophic arthritis; chronic infectious arthritis)
 1. Adult type.
 2. Juvenile type (Still's disease)
 3. Ankylosing spondylitis (Marie-Strumpell)
 4. Psoriatic arthritis.
 - (c) Arthritis associated with various infections.
- III. Degenerative arthritis (osteoarthritis; hypertrophic arthritis)
 - (a) Generalized; etiology unknown.
 - (b) Localized.
 1. Secondary to trauma.
 2. Secondary to structural abnormality.
 3. Secondary to previous infectious arthritis.
 4. Etiology unknown.
- IV. Arthritis associated with disturbance of metabolism.
 - (a) Gout.
 - (b) Arthritis manifestations of other metabolic diseases.
- V. Arthritis of Neuropathic origin.
 - (a) Secondary to tabes dorsalis.
 - (b) Secondary to syringomyelia.
 - (c) Secondary to peripheral nerve lesions.
- VI. Miscellaneous forms.
 - (a) Arthritis of serum sickness.
 - (b) Arthritis of hemophilia.
 - (c) Intermittent hydra-arthritis.

Bacteriology of Rheumatoid Arthritis.—The earlier students of focal infection, particularly Rosenow³⁸ and his co-workers, emphasized the frequency with which streptococci were recovered from focal infections and from this they made the inference that rheumatoid arthritis was probably a streptococcal disease. This theory has enjoyed wide popularity for years. In 1929 the writer, in collaboration with Nicholls and Stainsby¹⁰ undertook a detailed study of the bacteriology of the blood and joints in patients with rheumatoid arthritis. By using a special culture method, streptococci were recovered from the blood in 62 per cent and from the joints in 67 per cent of 154 patients with rheumatoid disease. Most of the strains recovered in this series were attenuated streptococci. Control cultures on other normal individuals or patients suffering from other diseases yielded negative results. This work was repeated in

numerous laboratories with variable results, some confirming, others failing to confirm these observations. However, in the majority of instances, negative results were obtained. More recently Dr. Angevine and Dr. Steffen have endeavored to repeat the work of Nicholls and Stainsby, but their results have been entirely negative. As a result of these negative findings, one is forced to suspect that the streptococci recovered in earlier studies were contaminations, but this of course can not be absolutely proven.

In 1931, Cecil, Nicholls and Stansby¹² first noted the presence of specific agglutinins for the streptococcus hemolyticus in the sera of patients with rheumatoid arthritis. In a series of 103 cases of this disease, ninety-seven showed agglutination with the hemolytic streptococcus at a dilution of 1:640 or higher, while in a series of fifty normal controls, the serum in every case failed to give a strong agglutination reaction. The presence of these agglutinins has been confirmed by Dawson, Olmstead and Boots¹⁸ and a number of other investigators. The percentage of patients showing a positive reaction has varied according to different observers from 40 to 90 per cent. In the opinion of the writer, the percentage of cases showing this positive reaction will depend on the duration and severity of the disease. In well-established cases of several years duration and with active swelling of many joints, the percentage of positive reactions should be about 90 per cent. If all patients, including incipient cases, are included, the percentage of positive reactions will run between 55 and 60 per cent.

It was interesting to observe that the agglutination reaction is often strongly positive in patients whose cultures fail to reveal hemolytic streptococci, and this statement applies not only to blood and joint cultures, but to cultures from the throat, stools, etc. Because of this fact the question has been raised as to whether this is a truly specific agglutination reaction or a non-specific phenomena similar to the Felix-Weil agglutination of the proteus bacillus by the serum of patients with typhus fever. In the last year or so bacteriologists have shifted their interest from the streptococcus group of organisms to the so-called pleuropneumonia-like group. These peculiar micro-organisms are very tiny, varying from .5 μ down to 0.2 μ or less in diameter. From such granules slender threads may grow

out, which form a single filament, or they may bud out from several parts of the granule to form delicate star-shaped structures. These threads become branched and form a dense mycelial-like network. About the margins of the colonies the threads become enlarged to form coarse globular or club-shaped bodies. These organisms have been found to exist in symbiosis with the *Streptobacillus moniliformis*, the organism which Klieneberger³³ frequently obtained by inoculating mice with the pharyngeal exudate of rats. Recently Findlay²² and his co-workers have cultivated the pleuropneumonia-like organism from the joint tissue of rats suffering from a type of polyarthritis. They were able to reproduce the disease in mice by injecting into the foot pads filtered or unfiltered suspensions of joint tissue, or cultures grown from them, along with a bit of agar. Sabin³⁹ has also produced a chronic arthritis in mice by intravenous or intraperitoneal injections of cultures of the strain he isolated from the brain of a normal mouse. He described this as a progressive, proliferative polyarthritis, resembling rheumatoid arthritis in man. The process often goes on to ankylosis of one or more joints. Sabin was able to recover the organism in cultures from the joints as late as seventy days after inoculation by blind passages, that is, by a series of subcultures repeated at short intervals without waiting for evidence of growth to appear.

Another interesting etiological theory which has received considerable attention has to do with the role of vitamin deficiency in rheumatoid arthritis. This applies particularly to the studies of Rinehart³⁷ in relation to vitamin C deficiency. Rinehart found that chronic vitamin C deficiency in the guinea pig produces an arthropathy with many similarities to rheumatoid arthritis, and that in certain instances superimposed infection accelerates and accentuates the pathological process. In Rinehart's study on guinea-pigs the experimental infection, in the presence of adequate vitamin C, failed to produce arthritis. Rinehart points out that the general atrophic changes in rheumatoid arthritis, involving the bony skeleton, muscle and skin, are seen also in chronic vitamin C deficiency. Rinehart concludes that vitamin C deficiency may operate as a factor in the etiology of rheumatoid arthritis. It must be admitted that Rine-

hart has presented an intriguing theory, but one which does not receive much support from practical experience. In other words, there is very little clinical evidence to support the idea that patients with rheumatoid arthritis are suffering from a deficiency of vitamin C, and certainly vitamin C in large doses does not cure the disease.

Psychic Shock.—Several interesting articles have appeared recently on the relation of psychic trauma to the onset and recrudescence of rheumatoid arthritis. It seems quite likely that this is merely a predisposing cause, but the fact remains that a good many patients trace the onset of their disease to a psychic shock and many others give a history of some emotional disturbance preceding relapse. Cobb, Bauer and Whiting¹³ made a careful study on the relationship between the onset of exacerbations of arthritis and the emotional or environmental factors, and found that environmental stress, especially poverty, grief and family worry seem to bear a definite relationship to the onset of exacerbations of rheumatoid arthritis.

Treatment of Rheumatoid Arthritis.—The therapy of rheumatoid arthritis continues to be empirical, with new cures constantly coming in and going out. A revival of sulphur therapy has been attempted on the theory that the cells of an arthritic patient have lost the ability to retain sulphur. Sullivan and Hess,⁴² for example, expressed the belief that the cystine content of the finger nails of arthritic patients is definitely low, an indication of disturbed metabolism of sulphur. Freyberg,²⁵ however, has taken issue with this theory and has shown pretty clearly that the sulphur metabolism in arthritis is entirely normal.

So far as treatment of rheumatoid arthritis by medication is concerned, gold salts are now attracting the greatest interest. Gold therapy for arthritis was first instituted twelve years ago by Forestier.²⁴ It soon became quite popular in Europe, but was disregarded almost entirely by American students until quite recently. The mode of action of gold in arthritis is unknown. Intramuscular injections seem to be quite as effective as intravenous injections, and are probably safer. The drug is given in courses in much the same way as bismuth and arsphen-

amin in syphilis. The usual method of treatment is to begin with 25 to 50 milligrams, and work the dose up to 100 milligrams. There is some difference of opinion as to what constitutes a course, but most authorities advise a total dosage of 1 to 2 grams, depending on how the patient reacts to the drug. Injections are usually given once a week, deep into the buttock with a long needle. Most writers recommend several courses, believing that relapses and failures result when only one course is administered. Patients on gold therapy should be followed with frequent blood counts, urinalyses and sedimentation tests.

Of the number of different gold products on the market, the most popular ones in this country are sodium gold thiosulfate, Solgonol B, and Myochrysine. Reactions to gold are numerous and some of these may be quite serious. Occasionally fatal results have been noted. Many patients have an immediate vasomotor disturbance, which is not serious but unpleasant, following the injection. Undoubtedly the commonest form of toxic reaction is drug dermatitis, which appears as a dry scaly itching erythema or morbiliform rash. Occasionally severe exfoliative dermatitis is encountered. Next to dermatitis, the writer has found stomatitis the commonest toxic manifestation, showing itself as a loss of taste, sore tongue and gums, or an ulcerative stomatitis. A few patients develop acute gastro-intestinal symptoms with fever, vomiting, epigastric pain and diarrhea. Occasionally acute hepatitis with jaundice is encountered, and rarely acute yellow atrophy. Occasional instances of glomerular nephritis occur, and finally purpura hemorrhagica, aplastic anemia and agranulocytosis. While exfoliative dermatitis is extremely unpleasant and may occasionally be serious, it is the disturbances of the hematopoietic system which are the most to be feared. Some observers believe that the toxic manifestations of gold therapy can be avoided by simultaneous injection of calcium gluconate; others recommend liver extract or glucose.

In spite of the dangers attendant to gold therapy, most investigators who have had extensive experience with the gold salts are quite enthusiastic over the results obtained. Hartfall and Garland²⁹ saw results which were little short of miraculous on patients showing various grades of disability. They also noted improved

general health and appetite, gain in weight and reduction in sedimentation rate. The writer has now treated over 200 cases of rheumatoid arthritis with gold therapy. Unfortunately time has not been yet available for a careful analysis of these figures. Like many others, my earlier experiences with gold were discouraging. A severe case of exfoliative dermatitis was encountered quite early, and this engendered a fear of the drug which prevented adequate dosage being administered to other patients. With increasing experience, however, I came to place a high value on gold, particularly Myochrysine, with which I have done most of my work. I have encountered no serious disturbances in the blood. There have been three cases of exfoliative dermatitis; two have been quite severe. I have seen a few quite remarkable recoveries and many others that were striking, particularly when the drug was administered early in the disease. In conclusion, I think it is fair to say that gold therapy marks an important advance in the treatment of rheumatoid arthritis. It is a dangerous agent, but in the hands of an experienced therapist it can be used with great benefit in the treatment of rheumatoid patients. Perhaps the greatest objection to the drug is that a good many patients simply cannot take it without developing a skin rash. With the development of dermatitis, of course, the drug has to be discontinued, sometimes only temporarily, at other times permanently.

Vaccine therapy is still popular in many arthritis clinics, but has lost some of its vogue because of the growing popularity of gold therapy. However, in the writer's opinion, streptococcus vaccine still has a place in the treatment of rheumatoid arthritis. In our clinic we use it on those patients who cannot take gold, and occasionally it is used in combination with gold.

Fever therapy has been extensively tried and there are now numerous reports in the literature. The results are fairly consistent. The majority of the patients receive relief from fever therapy, but in most cases this benefit is only temporary. However, there remains about 10 per cent of patients who are really greatly benefited by fever therapy. These are usually early cases, and in such patients I am always tempted to try fever therapy at least once or twice, just to discover how they react to treatment.

Vitamins have become an integral part of the routine therapy of rheumatoid arthritis, most of the physicians giving generous quantities of A, B, C and D to arthritic patients. I have already referred to Rinehart's studies on vitamin C in relation to rheumatoid arthritis, though of particular interest is the work of Dreyer and Reed,¹⁹ who strongly advocate massive daily doses of vitamin D for the treatment of rheumatoid arthritis. The doses recommended of 200 to 250 thousand U. S. P. units a day frequently excite toxic symptoms, chiefly nausea, anorexia, lassitude, diarrhea and severe gastrointestinal pain. Some writers, notably Irons,³ offer objections to this massive vitamin D therapy on the plea that some permanent injury might be done by such doses. Massive vitamin D therapy has not met with an enthusiastic response from the profession. Slocum and Hench⁴¹ were unable to obtain any benefit from this therapy on twenty-five rheumatoid patients, and similar negative results have been reported by Bauer.¹ The writer's own personal experience has also been disappointing.

A word must be said here about the studies of Hench³⁰ on the relation of jaundice to rheumatoid arthritis, and its application in the use of bile salts. It has been known for some time that an attack of catarrhal obstructive jaundice would produce a remarkable amelioration in the symptoms of rheumatoid arthritis. Hench³⁰ studied thirty-one cases of atrophic arthritis and fibrositis in relation to jaundice. In most instances the jaundice was caused by the toxic action of cinchophen, but the patients who had simple catarrhal jaundice expressed similar relief. In the majority of cases, marked reduction of pain and swelling and a striking increase in motion accompanied the more or less complete analgesia, and the rheumatic process appeared to have suddenly become inactive for varying periods, sometimes only for days or weeks, occasionally for months or years. Only a few weeks ago the writer had an opportunity to study one of these cases at close range. A young woman, aged twenty-four, with typical rheumatoid arthritis of four years duration, was put on gold therapy. After she had had about ten injections of Sanochrysine, she developed a toxic hepatitis with headache, jaundice and bile-stained urine. The jaundice appeared about two months after the last injection.

tion of gold and lasted four to five weeks. Previous to the onset of the jaundice, she had considerable arthritis in various joints, with swollen wrists and ankles, several fusiform fingers and swelling of the right knee. Within a week or so after the onset of jaundice, the swelling and pain disappeared entirely from her joints and there was complete restoration of function. This period of inactivity lasted three months, when the symptoms in her joints gradually returned to the state they had been in previous to the attack of jaundice. These observations on jaundice and its effect on rheumatoid arthritis has led to the administration of bile salts to patients with this disease. Thompson and Wyatt⁴⁷ employed bile salts alone and bilirubin alone without any beneficial effect. However, the *combination* of bilirubin and bile salts seemed to have a favorable influence on the symptoms. Hench,³⁰ however, was unable to confirm these observations. Margolis³⁵ has employed autolyzed liver which, in his experience, produced exacerbation of the symptoms. Davis,¹⁶ working in our Department of Physiology at Cornell, believes that crude liver extract, when given in large doses, has a favorable effect on the course of arthritis, but I have not been able to confirm this observation on a very limited number of cases. Everyone seems to be agreed that jaundice, either natural or experimental, is not a cure for arthritis, but is only a temporary palliative.

Rheumatic Fever

Coming now to the subject of rheumatic fever, we find a situation quite similar in many respects to that which exists in rheumatoid arthritis, particularly in so far as studies on etiology are concerned. The disease is still classified as probably infectious, though of unknown origin, and the weight of opinion still favors the hemolytic streptococcus as the causative agent. The reasons for this opinion are obvious enough and have been particularly stressed by Coburn¹⁵ and others in their studies on the relation of rheumatic fever to acute respiratory infections.

Green²⁷ has recently cultured the throat of patients with acute rheumatic fever and compared his results with cultures from nonrheumatic controls. Hemolytic streptococci were recovered in 58 per cent of the rheumatic cases and from only 30 per cent of the nonrheumatic

cases. More recently Green²⁸ claims to have actually recovered hemolytic streptococci from cardiac vegetations of patients dying of rheumatic fever. We have not been able to corroborate this work, however, in our own investigations. A decade ago the writer, in collaboration with Nicholls and Stainsby,¹¹ recovered streptococci of various types from the blood and joints of patients with acute rheumatic fever. These results, however, have not been confirmed by recent studies in our laboratory and the previous findings are therefore open to the same criticism that has been made of the positive cultures obtained in rheumatoid arthritis.

Positive skin reactions to extracts of hemolytic streptococci are present in a considerable percentage of rheumatic fever patients, and this has been stressed recently by Goldie,²⁶ who obtained positive reactions in 77 per cent of rheumatic fever cases and in only 32 per cent of controls.

It has been shown by numerous observers that rheumatic fever is particularly prone to follow hemolytic streptococcal infections of the throat or tonsils or accessory sinuses. Coburn and Pauli¹⁸ found that agglutination and complement fixation reactions of sera from patients with rheumatic fever pointed definitely towards streptococcus infection. Furthermore they found that precipitin tests indicated that at the time of the rheumatic attack, patients develop in their blood specific precipitins to the protein fractions of the streptococcus hemolyticus. Finally, these same authors demonstrated that at the onset of rheumatic fever there occurs in each instance a rise in the antistreptolysin titer of the patient's serum. The authors consider this rise in antistreptolysin as particularly strong evidence of recent infection by the hemolytic streptococcus. These studies of Coburn have been repeatedly confirmed in various laboratories and certainly point strongly towards a streptococcal factor in the disease.

Virus Theory.—So-called virus bodies have been found in the exudates from various cases of rheumatic fever by Eagles,²⁰ Schlesinger⁴⁰ and others of the English school. These so-called elementary bodies are agglutinated by the patient's serum, but apparently possess no pathogenesis for animals. Until some definite proof of pathogenicity has been established, bacteriol-

ogists are not likely to give these studies very serious consideration. In our laboratory Dr. Angevine and Dr. Rothbard⁴ have made repeated efforts to cultivate a virus from the blood and exudates of patients with rheumatic fever, but always without success.

With respect to the rôle of vitamin C deficiency in rheumatic fever, others have followed the original studies of Rinehart³⁷ and have thrown additional light on the subject. There seems to be some vitamin C deficiency in the blood of patients with rheumatic fever, but this has been found to be the case in almost any febrile infection, all of which militates against the theory that vitamin C deficiency plays an important part in the etiology of rheumatic fever.

It seems fitting at this point to say something further about the so-called pleuropneumonia-like organisms in their relation to rheumatic fever. Swift and Brown⁴⁵ have reported the finding of pleuropneumonia-like organisms in the joint fluids of cases of acute rheumatic fever. This was accomplished first by cultivation on the chorioallantoic membrane of chicks by frequent serial passages. After about five passages, characteristic lesions appeared which were not obtained with exudates from other sources and from which pleuropneumonia-like organisms were cultivated on suitable media. Secondly, by intranasal inoculation of mice with exudate or with suspensions of inoculated chorioallantoic membranes, they produced a pneumonia free from ordinary bacteria from which, directly or after filtration, they could produce the characteristic lesions on chorioallantoic membranes and could recover pleuropneumonia-like organisms by direct culture. In their article, however, they do not report the production of arthritis with these strains, and in a recent report by Swift⁴³ before the International Congress on Microbiology in New York City, he expressed serious doubt concerning the findings in his previous report.

In our investigations on rheumatism at Cornell, Angevine and Rothbard,⁵ using the methods of Kleiueberger,³⁴ have made repeated efforts to cultivate pleuropneumonia-like organisms from the blood, exudates, and pathological tissue of patients with rheumatic fever, but always without any success.

Treatment of Rheumatic Fever.—There have been no outstanding new developments in treatment. Something, however, should be said about chemotherapy in relation to both rheumatic fever and rheumatoid arthritis. Swift, Moen and Hirst⁴⁶ have tried sulfanilamide in the treatment of chronic recurring rheumatic fever. No benefits were noted; indeed, the rheumatic manifestations were intensified. Disappointing results were also reported by Massell and Jones,³⁶ who treated 58 patients with rheumatic fever, including 7 with chorea. Quite negative results have been reported by other observers, and the drug is equally disappointing in the treatment of rheumatoid arthritis.

Of special interest, however, in the prevention of rheumatic fever are the recent studies of Coburn and Moore,¹⁴ who have recently published an interesting study on the value of sulfanilamide in the prevention of rheumatic fever. Rheumatic children were given maintenance doses of the drug (about 2 Gm. daily) over a period of months and were observed with respect to the incidence of hemolytic streptococcus infections and recurrences of rheumatic fever. No toxic effects from the drug were observed. Only one of the twenty-six patients so treated contracted an infection with hemolytic streptococci in the throat flora, and only one of the twenty-six highly susceptible rheumatic children developed active rheumatism. However, sulfanilamide administered to rheumatic subjects after the onset of streptococcic throat infections did not prevent rheumatic recrudescences. This important contribution to the prophylaxis of rheumatic fever seems to offer real promise as a practical measure of preventing recurring attacks of the disease.

Experimental Arthritis.—Bacteriologists continue to be interested in the study of experimental arthritis. In our own laboratory the writer, in collaboration with Angevine and Rothbard,⁹ have recently published the results of extensive study on experimental arthritis in rabbits produced with streptococci and other organisms. Experimental arthritis was produced successfully with both streptococcus hemolyticus and streptococcus viridans. However, we were also able to produce an arthritis with staphylococcus aureus, pneumococcus, and paratyphoid bacillus A. The pathological picture produced

by these bacteria was very similar to that produced by streptococci.

In the February number of the *Journal of Experimental Medicine* Angevine and Rothbard³ have called attention to the mechanism by which bacteria become localized in the tissues of the joints and eyes. Histological examinations of sections from the eyes and joints of large numbers of rabbits injected with hemolytic streptococci has clearly demonstrated that when arthritis or cyclitis occurs, the synovial villi and ciliary processes are the most frequent and usually the primary sites of inflammation. By special methods for demonstration of bacteria, it has been shown that bacteria which found lodgment in either an eye or a joint were demonstrable first in the vessels of ciliary processes or synovial villi. A localized synovitis or iridocyclitis is brought about by the localization of bacteria in the synovial villus and ciliary process. These experiments, which give a clearer insight into the pathogenesis of infectious arthritis and iritis, explain why both may occur in association with certain infectious diseases.

The streptococcal theory of arthritis and rheumatism still seems to me to be the favorite theory. Perhaps eventually, however, we may find that the joints are not actually infected, but become sensitized in some way which we do not yet quite understand. Faber²¹ in 1915 sensitized the joints by intra-articular injections of killed green streptococci, and stated that subsequent intravenous injections of the same organism lodged more readily in the prepared joints. He regarded this sensitization as specific within set limits, although he did not claim that the sensitization was specific for various strains of streptococci. Swift and Boots⁴⁴ in 1923 sensitized the joints of rabbits by intra-articular injections of nonhemolytic streptococci and subsequently infected the animals with intravenous injections of streptococci. They concluded that, because arthritis developed in many nonsensitized as well as in sensitized joints, sensitization was not an important factor in the development of arthritis. More recently Dr. Angevine⁶ has returned to this problem and has obtained some interesting results. Rabbits were injected either intravenously or intradermally with heat-killed hemolytic streptococci and subsequently injected intravenously with living organisms. Arthritis was produced in the intravenously immunized

rabbits with a smaller number of bacteria than was required to produce the disease in normal or intradermally immunized animals.

In another series of experiments the right knee joints of rabbits received repeated injections of small amounts of either heat-killed streptococci or a nucleo-protein fraction. When the animals were subsequently infected intravenously with living cultures of the same organism, the previously injected joints were more susceptible to infection than were joints that had been injected either with heat-killed staphylococci or horse serum. In these studies, which have not as yet been published, it would appear that the relation of bacterial allergy to joint infection is a subject which has not yet been completely elucidated.

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CLINICAL ASPECTS OF VITAMIN B DEFICIENCIES*

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THE vitamin B complex is known to contain at least a dozen fractions, four of which are available in crystalline form in amounts adequate for clinical use. These are thiamin chloride (B_1), riboflavin (B_2), nicotinic acid (p-p factor), and pyridoxin (B_6). Another factor, pantothenic acid (filtrate factor), has recently been synthesized and is just now becoming available for clinical investigation. Through the controlled use of these crystalline B-vitamins, the clinical investigator has made progress hitherto impossible when only concentrates were available. This progress has been mainly in three directions:

1. In recognizing the particular clinical manifestations of deficiency of each of the crystalline B-vitamins.

2. In recognizing the true etiology of certain clinical syndromes.

3. In recognizing that deficiency diseases in man are usually not single but multiple.

The diagnosis of deficiency in the B-vitamins depends, at the present time, upon a clinical eval-

uation of the history and the signs and symptoms presented by the patient.⁶ A vitamin B deficiency should be suspected in the following groups of persons:

1. *The Indigent and Low Income Groups.*—The average American diet affords a small margin of safety in the B-vitamins. In vitamin B_1 this margin amounts to only 20 to 80 per cent.⁵ This safety margin, though below the optimum, provides sufficient amounts of the B-vitamins to protect against deficiency disease under ordinary physiologic conditions. As this diet is average, it follows that a considerable fraction of the American population must consume a super-average and a considerable fraction a subaverage amount of the B-vitamins.

2. *Persons Who Have Erroneous Dietary Habits and Food Idiosyncrasies.*—Regular consumption of extra-dietary supplements of vitamin-free calories as obtained from sugar, corn syrup, alcohol, candy, pastries, or soft drinks, may render a marginal diet inadequate. In evaluating the adequacy of a diet we must always scrutinize the dietary of any subject who remem-

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bers what he has eaten. The average person consuming a mixed and varied dietary not limited by idiosyncrasies or restrictions rarely remembers this. The more varied the diet, the less likely it is to be inadequate.

3. *Alcohol Addicts*.—These subjects often consume amounts of vitamin-free alcohol sufficient to lower the vitamin calory ratios significantly, even when an otherwise adequate diet is maintained.^{7,8,10} A smaller consumption of biologically good calories, and impaired absorption or utilization of the vitamin, are additional factors leading to vitamin deficiency in these subjects.

4. *Patients Having Diseases Altering the Vitamin B Requirements*.—The better known of these are listed in Table I. This table indicates the wide possibilities for the development of secondary vitamin deficiencies.

Thiamin Deficiency

The signs and symptoms attributed to vitamin B₁ deficiency are legion, the most definite being anorexia, fatigue, a neurological and a circulatory syndrome. Anorexia and fatigue are non-specific. In their presence the possibility of vitamin B₁ deficiency should be considered and confirmatory signs should be sought. When these symptoms occur without supporting objective signs, and do not definitely respond to thiamin therapy within seventy-two hours, they are probably not due to vitamin B₁ deficiency alone.¹⁴

The neurological manifestations of vitamin B₁ deficiency are those of bilateral and symmetrical polyneuritis involving first and predominantly the lower extremities. Peripheral neuritis that involves a single nerve, or that is not bilateral and symmetrical, or that does not involve first and predominantly the lower extremities is, in our experience, probably not due to vitamin B₁ deficiency alone. For such neuritides other etiological agents should be sought.

For the purpose of clinical investigation we have classified the neurological manifestations according to severity into four groups: suggestive, mild, moderate, and severe. Heaviness of the lower extremities, and calf muscle cramps are usually the first symptoms. These are followed by paresthesias in the toes and fingers, burning of the feet, and pains in the legs. It should be emphasized that pain, though nearly always pres-

TABLE I. FACTORS ALTERING THE VITAMIN B₁ REQUIREMENT*

- I. Increase in Total Metabolism
 - A. Abnormal activity, as associated with
 1. Prolonged strenuous activity
 2. Delirium
 3. Manic depressive psychosis, manic type
 - B. Fever, especially of long duration, as in
 1. Tuberculosis
 2. Typhoid
 3. Malaria
 - C. Hyperthyroidism
 - D. Pregnancy
 - E. Rapid Growth
- II. Faulty Assimilation
 - A. Diarrhea, especially of long duration as in
 1. Ulcerative and mucous colitis
 2. Intestinal parasites
 3. Intestinal tuberculosis
 4. Sprue
 - B. Gastrointestinal fistulae
 - C. Diseases of liver or gall bladder
 - D. Achlorhydria
 - E. Carcinoma of stomach
- III. Increased Excretion
 - A. Polyuria, as in
 1. Uncontrolled diabetes mellitus
 2. Diabetes insipidus
 3. Long continued excessive fluid intake, as in urinary tract infections
 - B. Lactation

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ent, can often be elicited only by a leading question. Calf muscle tenderness and plantar hyperesthesia are as a rule the earliest objective signs. The hyperesthesia may extend up the ankles and legs in a sock distribution. Vibratory sensation may be lost in the toes. These signs we classify as suggestive, and a positive diagnosis of polyneuritis is not made, as circulatory disturbances may cause these or very similar findings. When, however, in addition to these signs, the ankle jerks are absent, a diagnosis of mild polyneuritis can be made. As the deficiency continues, the sensory and motor changes advance, the knee jerks disappear, position sense in the toes becomes impaired, calf muscle atrophy develops, and foot drop follows. We classify this degree of involvement as moderate, provided the signs are confined to the lower extremities. When there is also involvement of the upper extremities, the spinal cord, or the cranial nerves, or when a "central neuritis" is present, we classify the polyneuritis as severe.

The circulatory manifestations of vitamin B₁ deficiency do not form a rigid clinical picture.^{4,9,11} They may occur in a person whose circulatory system is otherwise normal, or they may be superimposed on one previously damaged by degen-

crative, hypertensive, or inflammatory disease. These circulatory manifestations, as observed by Weiss and Wilkins,^{23,24} Jones and Sure¹⁵ and in our clinic, may be classified as follows:

1. Edema and serous effusions occurring in the absence of congestive heart failure, enlarged heart, or recognized etiologic factors producing edema and serous effusions.

2. Edema and serous effusions occurring with supporting signs and symptoms of congestive heart failure, usually with definite roentgenographic evidence of cardiac enlargement.

3. Sudden circulatory collapse which may be the first manifestation of circulatory failure or may occur after other signs of circulatory failure are well advanced.

The circulatory manifestations of vitamin B₁ deficiency occur in about one-third of vitamin B₁ deficient subjects manifesting definite polyneuritis. They are more likely to occur in patients with suggestive or mild involvement than in those having advanced neuritis. This factor is related to the ability of persons with mild neuritis to perform muscular exertion.

Some of the more characteristic diagnostic features of the circulatory manifestations of vitamin B₁ deficiency are:

1. Mild nature of the polyneuritis.
2. Increased or normal velocity of the blood flow in the presence of congestive heart failure.
3. Rapid response to specific therapy with complete and permanent reversibility of the circulatory manifestations.

Riboflavin Deficiency

Riboflavin is a necessary constituent in the diet of many animals. In the rat its lack leads to failure in growth, to a senility, alopecia, a non-specific dermatitis and keratitis; in the dog an acute deficiency leads to spasticity, generalized weakness, circulatory collapse and a "yellow" liver, while a chronic partial deficiency results in signs characterized clinically by ataxia. Although riboflavin is presumably present in every living cell and is concerned with the chemical reactions involved in cell respiration, no distinct clinical syndrome in man had been attributed to its deficiency prior to Sebrell and Butler's¹⁹ report.

The lesions produced by Sebrell and Butler in ten of eighteen women maintained on the diet

of Goldberger and Tanner appeared ninety-four to 130 days after the beginning of the experiment. They began "as a pallor of the mucosa of the lip in the angles of the mouth without involvement of the buccal mucosa. This pallor was soon followed by maceration, and within a few days superficial transverse fissures appeared, usually bilateral, and exactly in the angle of the mouth. These fissures extended somewhat downward from the angle. . . . In some instances the fissures continued to extend onto the skin for a distance of as much as half an inch. These lesions resemble those described as *perlèche*. At about the time the fissures were seen, the lips became abnormally red along the line of closure. This was due apparently to a superficial denudation of the mucosa. In addition to the cheilosis, there was also seen a fine, scaly, slightly greasy desquamation on a mildly erythematous base in the nasolabial folds, on the *alæ nasi*, in the vestibule of the nose and on the ears."

Under the conditions of the experiment these lesions were alleviated by the administration of synthetic riboflavin, but not by nicotinic acid. The authors' conclusion that the condition is a manifestation of riboflavin deficiency seems warranted. Since then, Oden, Oden and Sebrell¹⁸ have reported three patients from rural Georgia with similar lesions which responded promptly to 5 mg. of synthetic riboflavin given daily. They believe, since the Odens have seen many similar cases in their practice in rural Georgia, that ariboflavinosis is in all probability a common deficiency disease in the southern United States. Sydenstricker²² thinks that these lesions are "even more frequent than frank pellagra." Sydenstricker's¹⁶ group has reported, in addition, a keratitis associated with these signs of riboflavin deficiency in ten subjects.

We¹³ have reported fifteen subjects having lesions due, we believe, to ariboflavinosis. Thirteen of these subjects were alcoholic, one had advanced pulmonary and intestinal tuberculosis and one was an epileptic. In this group of fifteen patients, thirteen had nicotinic acid deficiency, seven had vitamin B₁ deficiency and three had vitamin C deficiency. Only one patient had no clinical evidence of another vitamin deficiency. Since then, however, we have observed three additional subjects, all university students, who presented no clinical evidence of another deficiency disease. The facial lesions seen consisted of filiform

excrescences of a seborrheic nature, apparently derived from the sebaceous glands, varying in length up to 1 mm., closely to sparsely scattered over the skin of the face. Their characteristic location was in the nasolabial folds, but in addition they occurred frequently on the *alæ nasi*, occasionally on the bridge of the nose and sometimes on the forehead above the eyebrows. The skin on which the excrescences were located was the seat of a fine, scaly, greasy desquamation. On casual inspection these filiform lesions resembled urea frost, but they could not be brushed off by rubbing with the fingers. In addition, most of the patients showed fissures and maceration at the angles of the mouth, and a degenerative crust-like formation on the epithelium of the lips, most marked on the lower. The fissures at the angles of the mouth were bilateral and extended laterally 1 to 3 mm. onto the mucous membrane of the mouth and 1 to 10 mm. onto the skin. They were usually very shallow but were sometimes 0.5 mm. deep, and their bases as a rule showed little or no increased redness. Extending for 5 to 20 mm. from the angle of the mouth onto both lips, the mucous membrane was macerated and wrinkled and pearl-gray. The lips, particularly the lower, frequently showed a marked increase in the vertical fissuring, often without a break in the mucous membrane. Occasionally, the vestibule of the nose was involved, with lesions similar to those on the lips. We observed no lesions on the ears.

Our first ten subjects, all of whom were pellagrins, were maintained with the diet of Goldberger and Tanner. After a control period of three to fifteen days, during which neither the facial lesions nor the cheilosis improved, various preparations then being tested for their value in the treatment of pellagra were given. Preparations which produced a cure of the stomatitis of pellagra were followed also by disappearance of the facial and lip lesions now ascribed to riboflavin deficiency. These were vegex, brewers' yeast and liver residue. Highly concentrated liver extract effective in pernicious anemia, as well as cod-liver oil, linseed oil, cevitic acid and thiamin chloride were ineffective not only in pellagrous stomatitis but also on these facial and lip lesions. For this reason we believed that the lesions were all part of pellagra.

When, however, we began the treatment of our pellagrins with nicotinic acid while still main-

taining them on the diet poor in the vitamin B complex, although we obtained dramatic responses in the oral, gastrointestinal and mental manifestations of pellagra, the facial and lip lesions were not affected. After the response to nicotinic acid, two of these patients were given a full diet supplemented with 18 gm. of vegex daily by mouth. The characteristic facial and lip lesions promptly improved.

At this time Sebrell and Butler's report appeared. Their description of the lesions which they had produced experimentally suggested to us that the lesions we had been observing in our subjects were probably signs of more advanced states of riboflavin deficiency. If true, this observation would explain their failure to respond to nicotinic acid and their response to a full diet plus vegex, brewers' yeast or liver residue, substances rich in riboflavin. We, therefore, determined to test the effect of synthetic riboflavin on the lesions occurring in our subjects.

By maintaining patients having these characteristic lesions of riboflavin deficiency with a diet poor in the B complex we demonstrated that these lesions respond to synthetic riboflavin, but not to thiamin chloride, nicotinic acid or vitamin B₆.

Nicotinic Acid Deficiencies

The signs and symptoms of partial chronic nicotinic acid deficiency, particularly those occurring in pellagrins, are so well known from the work of Spies, Sydenstricker and Smith and their co-workers that it is not necessary to describe them in detail. The complete picture consisting of a scarlet-red stomatitis and glossitis, diarrhea, bilateral symmetrical dermatitis and mental aberrations form in combination such a characteristic syndrome that they are widely recognized and should never go unrecognized. It is not so well understood, however, that the oral lesions, the gastro-intestinal lesions, the mental changes or the skin lesions may each occur alone or in any possible combination. For example, the patients having the stomatitis of nicotinic acid deficiency are too frequently considered to have only the superimposed Vincent's infection. The primary diagnosis is not considered and specific therapy is neglected. If nicotinic acid therapy is instituted not only is the scarlet-red stomatitis blanched within 24 to 48 hours, but the Vincent's infection heals without

other general or local therapy. The mental changes may precede the skin, gastrointestinal or oral changes and the patient may be labeled as a neurasthenic, neurotic or psychoneurotic. Similarly, gastrointestinal manifestations may precede all the others, and the diagnosis may be missed for many weeks.

We¹² have reported 150 cases of an "encephalopathic syndrome," a condition heretofore almost always fatal, which we believe is caused by nicotinic acid deficiency. This syndrome may occur as the only clinical manifestation of a deficiency disease or it may occur in association with pellagra, polyneuritis due to vitamin B₁ deficiency, the oculomotor disturbances of a "central neuritis," or scurvy. The clinical picture of this encephalopathic syndrome is more or less well defined and is characterized by clouding of consciousness, cogwheel rigidities of the extremities, and uncontrollable grasping and sucking reflexes.

Bender and Schilder,² who have described its clinical picture, included this syndrome as one of a group of five which they called collectively "encephalopathia alcoholica." Their classification of the types of encephalopathia alcoholica was related to the most prominent manifestations: (1) clouding of consciousness and changing rigidities, (2) cerebellar symptoms, (3) catatonia, (4) alcoholic delirium, and (5) polyneuritis. Groups 1 and 5 were clinically similar, the difference being that in group 1 the polyneuritis was minimal or absent while in group 5 the polyneuritis was so marked as to constitute the most prominent manifestation. We believe that these two groups are identical, differing only in the degree of clinical vitamin B₁ deficiency superimposed on a nicotinic acid deficiency or vice versa. Groups 2, 3 and 4 present different clinical pictures distinct from the specific encephalopathic syndrome reported herein. We also believe that the oculomotor disturbances when they occur are a manifestation of a disease process distinct from this specific encephalopathic syndrome. Likewise to be excluded are the encephalopathic manifestations of groping, grasping and sucking which may occur during the course of delirium tremens, acute alcoholic hallucinosis, expanding intracranial lesions, infectious diseases with delirium, advanced cerebral arteriosclerosis and other diseases.

The encephalopathic syndrome does not occur exclusively in alcoholic patients. Both Spies²⁰

TABLE II. RELATION OF THERAPY ON 150 SUBJECTS HAVING THE ENCEPHALOPATHIC SYNDROME*

Treatment	Cases	Deaths		Died Corrected	
		No.	Percent	From Other Causes	Mortality Percent
House diet, dextrose and saline solution	47	45	95.7	3	89.4
House diet, dextrose and saline solution, thiamin chloride...	15	15	100.0	0	100.0
Vitamin rich diet, dextrose and saline solution, vitamin B complex	66	41	62.2	7	51.5
Basal diet, dextrose and saline solution, nicotinic acid	22	7	31.8	4	13.6

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and Sydenstricker²² have observed this syndrome in endemic pellagrins. Some of the cases of pellagra described by Matthews¹⁷ (cases 2 and 9) may very well have manifested this encephalopathic syndrome, although his report does not include recorded observations of grasping and sucking reflexes or of cogwheel rigidities of the extremities. Cleckley, Sydenstricker and Geeslin³ have studied a group of subjects having stupor which responded to nicotinic acid therapy. We believe that several of their protocols are probably descriptions of the encephalopathic syndrome which we are reporting here. Prior to 1933, patients admitted to our service having this encephalopathic syndrome almost invariably died irrespective of the treatment given. Since most of the patients were dehydrated, it seemed reasonable to attempt hydration by infusions of 5 per cent dextrose in physiologic solution of sodium chloride. A total of forty-seven patients were thus treated (Table II), forty-five of whom died while exhibiting the encephalopathic syndrome. Three of these patients had other diseases which were probably fatal (pneumococcal pneumonia, ruptured duodenal ulcer, subarachnoid hemorrhage); if these are discarded a corrected mortality of 89.4 per cent is obtained.

Most of these subjects had polyneuritis due to vitamin B₁ deficiency. A considerable number had stomatitis, which in fifteen instances is now recognized as having been similar to the stomatitis of patients with pellagra. Its frequent association with known deficiency diseases suggested that the encephalopathic syndrome too might be a manifestation of some nutritional lack. If so, then from its commonest associations the defi-

ciency would most likely be of one or more fractions of the vitamin B complex. That the encephalopathic syndrome also occurred independently, in the absence of other clinical evidence of deficiency disease, suggested the possible lack of a distinct and perhaps as yet unidentified nutritional element. Since polyneuritis was the commonest associated disease, we studied the effect of parenteral administration of from 50 to 200 mg. of thiamin chloride daily while continuing the routine treatment of hydration. The fifteen consecutive patients thus treated all died without improvement in the encephalopathic syndrome. The next group of these patients was treated with vitamin rich diets supplemented by oral and parenteral administration of large amounts of preparations rich in the B vitamins: vegex, brewers' yeast, an aqueous whole liver extract and various fractions of liver. Of the total of sixty-six patients thus treated, thirty-three had other signs now recognized as due to deficiency of nicotinic acid. Twenty-five, or 37.8 per cent of these patients recovered; the rest died while manifesting the encephalopathic syndrome, a mortality of 62.2 per cent. Seven patients in this group, however, had in addition a probably fatal disease (three advanced pulmonary tuberculosis, two pneumococcic pneumonia, one streptococcus hemolyticus sepsis, one cirrhosis of the liver); discarding these, we obtain a corrected mortality of 51.5 per cent. This experience supported our hypothesis that the responsible factor or factors must be sought in the vitamin B complex, excluding thiamin chloride.

Shortly after nicotinic acid became available, we began to test the effect of nicotinic acid on our patients having the encephalopathic syndrome. Twenty-two consecutive patients with the encephalopathic syndrome were treated with nicotinic acid, seven of whom died, giving a mortality of 31.8 per cent. This death rate should be compared with the mortality of 95.7 per cent in forty-seven subjects treated by hydration alone, the mortality of 100 per cent in fifteen subjects treated by hydration plus thiamin chloride and the mortality of 62.2 per cent in sixty-six subjects treated by hydration plus the entire vitamin B complex. In the three groups not given nicotinic acid each subject who died did so without prior recovery from the encephalopathic syndrome. In the group treated with nicotinic acid, four of the seven subjects who died did so

one, two, four and ten days respectively after the disappearance of the encephalopathic syndrome and of diseases probably independently fatal (pneumococcic pneumonia, cirrhosis of the liver, streptococcus hemolyticus sepsis, multiple lung abscesses). On this basis the "corrected mortality" in the group treated with nicotinic acid is 13.6 per cent, as compared with 89.4, 100 and 51.5 per cent corrected mortality in the groups of patients not treated with nicotinic acid.

It seems unlikely that the response obtained for the patients treated with nicotinic acid could be due to some other factor. Hydration alone failed, hydration plus thiamin chloride failed, hydration plus vitamin B complex was partially effective but hydration plus nicotinic acid was successful in a large majority of cases. Assuming that nicotinic acid is the effective therapeutic agent, the significant decrease in mortality in the group treated with preparations containing the vitamin B complex can be attributed to the nicotinic acid content of those preparations. The failure of the same preparations in more than half of the treated subjects can be attributed to their relatively small content of nicotinic acid. That the results in the group treated with nicotinic acid were due to chance seems unlikely. Each group seems large enough for the results to be significant. It is noteworthy that before the use of nicotinic acid we had never witnessed recovery in four consecutive cases but had witnessed death in more than fifteen consecutive cases of the encephalopathic syndrome.

The fact that only about half of our subjects presented other signs of deficiency of nicotinic acid, and the fact that in endemic pellagra the encephalopathic syndrome occurs only in the more advanced and severe cases does not necessarily contravene the evidence that this encephalopathic syndrome is a manifestation of deficiency of nicotinic acid. Our explanation, which of course, is speculative, is as follows: As a complete deficiency of riboflavin leads to a different clinical picture than partial riboflavin deficiency, there may well be a similar difference in nicotinic acid deficiency. The encephalopathic syndrome represents, we believe, a complete nicotinic acid deficiency, while the pellagra syndrome (stomatitis, the gastro-intestinal, the common psychic symptoms and possibly the dermatitis) represents a partial deficiency of nicotinic acid not complete enough to produce the encephalo-

pathic syndrome. If this is so, patients having both pellagra and the encephalopathic syndrome would represent the picture of a partial deficiency of nicotinic acid of sufficient duration to cause the structural changes recognized as pellagra, on which has been superimposed a complete nicotinic acid deficiency, while patients showing the encephalopathic syndrome without signs of pellagra would represent a complete nicotinic acid deficiency which develops so rapidly that the structural changes in the mouth and skin characteristic of pellagra do not have time to occur.

Whether this explanation of the *modus operandi* is the correct one or not, it seems to us entirely justifiable on the basis of our observations, to attribute the etiology of the encephalopathic syndrome which we have described to nicotinic acid deficiency; as such, its proper label should be "nicotinic acid deficiency encephalopathy." By this designation we do not mean to imply that there are not other causes of encephalopathy, for disturbances in brain metabolism may and do occur as a result of other factors than lack of nicotinic acid. It is not to be expected that nicotinic acid should be effective in those cases or that its administration in appropriate instances will always result in cures, for the deficiency may be advanced to an irreversible stage.

Pyrodoxin

A specific syndrome in man attributable to a deficiency of vitamin B₆ or pyrodoxin has not as yet been reported. In rats, a deficiency of this vitamin is known to cause "rat acrodynia," foci of degeneration in striated and cardiac muscle and changes in the nervous system, particularly of the columns of the spinal cord. Antopol and Schotland¹ have recently suggested that vitamin B₆ through its pyridine structure may be involved in the enzyme system concerned in muscle metabolism. In this connection it is interesting to note that Spies²¹ and his co-workers noted increased muscle strength in patients with pellagra following its administration; Antopol and Schotland have reported on its beneficial effect on muscle strength in six patients having pseudo-hypertrophic muscular dystrophy, but warned that "it is not to be implied that this group of muscular dystrophies are due to avitaminosis B₆." In addition we have accumulated evidence that vitamin B₆ plays some part in the acne syndrome.

Syndromes collectively labeled paralysis agi-

tans, while not directly fatal, usually pursue a progressive course, and eventually the victims become helpless and seek hospitalization. Since muscular rigidity and weakness is characteristic of paralysis agitans, and since vitamin B₆ is involved in muscle metabolism, it seemed worthwhile to test its effect in this syndrome. We, therefore selected fifteen patients having paralysis agitans, all of whom were bedfast or chairfast, ten of these for more than three years. Six of our patients gave a history of encephalitis. All the patients received 50 or 100 mg. of vitamin B₆ hydrochloride by intravenous injection, either daily or every other day. Of the fifteen patients, four showed subjective and definite objective improvement. Two additional patients were subjectively improved. The following case histories are reported:

Case 1. A seventy-eight-year-old retired business man, was seen on November 15, 1939, because of aches and pains of ten days' duration, in all the extremities. Significant findings were stooped posture, expressionless face, and paucity of associated movements. An intention tremor of the hands was present. There were no rigidities. He was treated with diet, vitamin B-complex by mouth, liver extract and thiamin chloride parenterally. By January 2nd, the patient was worse, rising from a chair was a task, and rigidities of the extremities were now present. Thiamin chloride and liver extract were discontinued. Belladonna preparations were administered and continued at limit of tolerance until April 1. By March 1 the patient had to be helped in and out of bed, to dress, to shave and to bathe. He could rise from a chair only with difficulty but continued to feed himself. From that time he has been given 100 mg. of nicotinic acid three times daily. On March 23, as no improvement had been noted, he was given 100 mg. of vitamin B₆ by intravenous injection. This dosage has since then been repeated every other day. Within half an hour after the first dose, the patient could rise from a chair without difficulty, the rigidities became indiscernible, he could walk and he climbed stairs without assistance. By March 31, expression was again evident in the patient's face, and he was able to take short strolls outdoors. By April 6, he was able to bathe, shave and dress himself, and had gone to church. His posture is fairly erect. The associated movements have not returned and the intention tremor remains unaffected.

Case 2. A sixty-two-year-old white night watchman was admitted to Bellevue Hospital on March 13, 1940 because of helplessness of one week's duration and with a tremor of twenty years' duration. One week prior to admission, while at work, the patient fell and found himself helpless. Important findings were unintelligible speech, mask face, coarse tremors of the hands, and rigidities of all extremities. He was unable to rise in

bed or move his legs on command. He was given tincture of stramonium to point of tolerance. On March 25, his condition was unchanged and treatment with 100 mg. of vitamin B₆ daily by intravenous injection, plus 300 mg. of nicotinic acid and vitamin B-complex by mouth was begun. By April 8, the patient could feed himself, rise from a chair, and avail himself of toilet privileges. His face is mobile and his speech intelligible. The tremor is unimproved, the posture is bent, and the poverty of associated movements remains.

Case 3. A forty-seven-year-old laborer, was transferred to Bellevue Hospital on July 22, 1939, from the Farm Colony, where he had been a patient for two years. He was never ill until he had "influenza" in 1926 which lasted one week and was associated with drowsiness and double vision. Within three months the patient noticed tremor of the upper extremities. For seven years prior to admission to the Farm Colony he had been treated as an out patient at another hospital. Significant findings were expressionless face, unintelligible speech, half moon posture, paucity of associated movements, constant coarse tremors, and cogwheel rigidities of the upper extremities. He was treated with tincture of stramonium. During the following eight months the patient's condition remained unchanged. On March 25, he was transferred to this service, given vitamin B-complex plus nicotinic acid by mouth, and intravenous administration of 100 mg. daily of vitamin B₆ was started. During the first week no improvement was noticed. By April 8, there was subjectively an increase in strength, the tremor seemed diminished, and an increase in the emotional play of the face was commented on by all observers. The rigidities, posture, gait and poverty of associated movements seemed unchanged.

These cases represent examples of the so-called "arteriosclerotic," "idiopathic" and post-encephalitic types of paralysis agitans. The first two are examples of degenerative diseases, the third of a sequel of an acute infection. The first two subjects represent in terms of function (as measured by ability to perform their normal occupation, disability of four months and four weeks respectively; the third nine years of disability. These factors may explain the prompt response of the first two subjects and the failure of the treatment in the third. The two patients whose histories are not detailed here, in whom definite objective improvement was noted, were both in the seventh decade. Neither gave a history of encephalitis, and both had disability for less than three years. Of the eleven patients who showed no objective improvement, ten had complete disability for more than three years, and half of these gave a history of encephalitis; the other had a disability of six months but gave

a history of encephalitis. It is, therefore, emphasized that thus far objective beneficial results in helpless patients have been limited to lessening of rigidities and increase in strength in patients whose complete disability is of less than three years' duration, and who give no history of encephalitis.

In summary, the syndrome of paralysis agitans appears to include a group of persons whose manifestations, particularly the rigidities and weakness, respond to vitamin B₆.

Treatment of Vitamin B Deficiencies

In the treatment of deficiencies of the B vitamins I wish to stress two points:

1. Specific signs and symptoms of a specific deficiency responds promptly to adequate amounts of the specific chemical substance if the pathologic changes are not so advanced as to be irreversible.

2. Complete recovery of the patient does not always follow and adequate treatment does not consist of the administration of these specific chemicals either singly or in combination.

To illustrate these two points a case record is presented.

V. B., a thirty-four-year-old white female, was transferred to the Medical Service of the Psychiatric Division of Bellevue Hospital from an institution for the care of epileptics where she had been a patient for the past five years. When admitted she complained of weakness, bleeding gums, sore mouth and tongue, and a rash on the face and hands, all of some few weeks' duration. Her history included epileptic convulsions since the age of three, a craniotomy in 1932 without improvement in the convulsions, and an appendectomy in 1921. Her diet consisted chiefly of the following: Breakfast—oatmeal, coffee, and white bread; lunch—white bread and butter, potatoes, and a portion of stew; supper—tea, white bread and butter, prunes and apricots. She received one egg each week. The meat in the stew was never eaten by the patient, but given to others. In addition, she consumed daily large amounts of cake furnished by her parents so that the main constituents of her diet were cake and white bread.

Examination on admission showed a thin, undernourished, chronically ill female. She was coöperative, and oriented as to time, place and person. The epithelium of the lower lip showed degeneration with scaling and desquamation (cheilosis). There were fissures at the angles of the mouth extending about 2 mm. laterally in each direction from the mucocutaneous junction. There was moderate maceration of the tissues in the angles of the mouth. In the nasolabial folds and across the bridge of the nose there

was a seborrheic lesion consisting of filiform excrescences about 0.5 mm. in length, which appeared to protrude from the sebaceous glands. Superficially this lesion resembled urea frost, but it could not be rubbed off, and the underlying skin felt greasy. It was not present on the upper lip, vestibule of the nose, forehead or ears. In addition to this lesion there was an acneiform eruption over the face. The upper jaw was dentureless. The gums of the lower jaw were red and markedly piled up, consisting of bags of blood which bled on light touch. The tongue was clean, bald, and reddened as were the oral mucous membranes. Along the frenulum of the tongue were ulcerations covered by a pearl-gray exudate. On the right hand there was deep pigmentation over the second interphalangeal joint and thumb, a small ulceration over the knuckles, and a bracelet-like pigmented dermatitis of the wrist. The left hand exhibited a bracelet-like pigmented dermatitis and slight dermatitis over the second interphalangeal joint. There was increased keratosis of the elbows. There were no "necklace lesions" and no perineal lesions. There was no evidence of peripheral neuritis. A diagnosis of riboflavin, nicotinic acid and cevitic acid deficiency, and epilepsy, was made.

The patient was maintained with the diet poor in vitamin B complex. Studies of the blood revealed total absence of cevitic acid. The patient was then given 300 mg. of cevitic acid daily by intravenous injection, and 100 mg. four times a day by mouth. On the second day of this regimen there was definite improvement and on the following day the gums were natural in color. The stomatitis and glossitis had remained unchanged. The dosage of cevitic acid was then reduced to 200 mg. daily by mouth, and the diet poor in the vitamin B complex was continued. From the sixth day of hospitalization the patient was given 500 mg. of nicotinic acid daily, in doses of 100 mg. each, by mouth. By the eighth day of hospitalization the abnormal redness of the tongue and mucous membranes of the mouth had disappeared, the frenulum ulcer had healed, and the dermatitis of the hands was clearing. The lesions on the face and lips, however, were unchanged.

After eleven days of nicotinic acid therapy there seemed to be no significant change in the filiform lesions on the face or the lip lesions. Beginning on the seventeenth day of hospitalization administration of nicotinic acid was discontinued, but the patient was still maintained with the diet poor in the vitamin B complex; in addition, 10 mg. of synthetic riboflavin was administered daily by mouth. On the fifth day of this regimen a definite and marked improvement was noted. The degenerative epithelial lesions of the lips and the fissures at the angles of the mouth had cleared entirely, and the filiform lesions on the naso-labial folds and bridge of the nose had disappeared; the acneiform rash had also improved. The patient, however, now showed definite signs and symptoms of a mild peripheral neuritis characteristic of vitamin B₁ deficiency. She was then given 50 mg. of thiamin chloride daily by intramuscular injection. This was followed by complete disappearance of the signs and symptoms of peripheral

neuritis within three days. At this time (the twenty-seventh day of hospitalization) the patient was given the house diet supplemented daily by 200 cc. of orange juice and 18 Gm. of vegex, and the administration of riboflavin, cevitic acid and thiamin chloride were discontinued. The strength of the patient now markedly improved, and her weight increased from 84 pounds (on the twenty-seventh day of hospitalization) to 111 pounds when she was discharged on the fifty-third day of hospitalization.

These results demonstrate that the specific signs and symptoms of a deficiency disease respond to the appropriate pure chemical substances. By the use of these chemical substances the clinical investigator has learned that complete recovery of the patient does not always follow, and adequate treatment does not consist of the administration of these specific chemicals whether singly or in combination. This fact is amply demonstrated by this patient, for complete recovery, that is, gain in strength and weight, and disappearance of the acne, did not occur until a full diet supplemented by the entire vitamin B complex was administered. We believe, however, that a full diet plus the autolyzed brewers' yeast (vegex) furnishes other factors, both known and unknown, that cannot as yet be supplied by any known combination of pure chemical substances.

The vitamin B-complex preparations used in these studies were kindly furnished by The Vegex Co., New York; Lederle Laboratories, Pearl River, New York, and the Fleischman Laboratories, New York; the thiamin chloride, riboflavin, pyridoxin and nicotinic acid by Merck and Co., Rahway, New Jersey.

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RECENT ADVANCES IN THE TREATMENT OF HEPATIC DISEASE*

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IT has often been said that fundamental ideas of the nature of a disease determine to a greater extent than any other factor the manner of its treatment. If a condition is regarded as hopeless from the outset, an element of defeatism colors our therapeutic efforts. The various types of cirrhosis of the liver have been regarded for years as practically beyond the reach of treatment; they are, in fact, considered as affections which by their very nature "are above the powers of the constitution."⁸

Before considering some of the advances which are being made in the treatment of primary disease of the hepatic parenchyma, it is first necessary to establish the fact that hepatic lesions of this type are capable of making a response to therapy. One must survey the normal course of the disease to see what turn of events may be expected and what factors seem to influence prognosis. In this connection a study of experimentally produced hepatic disease brings out some interesting and important facts. Bollman and Mann were the first to show that only a very small part of the parenchyma of the liver is necessary to carry on normal metabolic functions, and that the body, therefore, contains hepatic tissue greatly in excess of the amount necessary to maintain normal activity. They have also been able to remove as much as 80 per cent of a dog's liver at one time without any particularly abnormal results. In addition to the

anatomic and physiologic reserves possessed by the liver, an unusual degree of regenerative capacity is also apparent. When from a fifth to three-quarters of the liver has been removed from a dog, regeneration of a mass of hepatic tissue equal to or greater than the weight of the removed portion is completed in from six to eight weeks. Several factors, however, may be shown to diminish or to inhibit completely regeneration of the liver after removal of portions of its substance. Diversion of portal blood by the establishment of an Eck fistula, ligation of the common bile duct or the presence of pre-existing damage to the parenchyma will exert such an effect.

If specific hepatotoxic substances, such as carbon tetrachloride, are given to the experimental animal, similar regenerative and reparative properties of the liver may be shown. By the use of repeated doses of such poisons, animals can be carried to a point that corresponds to the complete picture of atrophic portal cirrhosis in the human being. Even when this late stage of the disease is reached these animals can then be restored to normal health and a state of normal hepatic function. Naturally, one may ask whether under similar conditions, recoveries ever occur in the human being and whether the reserve and regenerative capacity of the liver of human beings ever reach the same extent. Because of the various stages at which the clinical disease is detected and because of differences in the type of treatment employed, it is difficult

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to find statistics on this point which are entirely satisfactory. In 1892, White reported that a review of the literature up to that time did not reveal a single case of uncomplicated cirrhosis of the liver with ascites which had long survived paracentesis; in his own series of cases, the time between the onset of symptoms and death averaged only about two months. In 1931, about forty years after White's report, Chapman, Rowntree and I reported a study of 112 cases of portal cirrhosis with ascites, encountered at The Mayo Clinic during the preceding six years. Eighty-four of these patients were treated according to a regimen that involved the use of a limited intake of fluid and salt and certain diuretic remedies. This plan of treatment, which was primarily directed at the removal of ascites and edema, was not without some beneficial effect. Of the 112 patients, eighty-four died and twenty-eight were alive at the time of the report. In the group in which survival did not occur, the average length of life after the development of ascites was sixteen months; of the twenty-eight patients living at the time of the report, the average length of life after the appearance of ascites was somewhat more than three years.

A more recent survey of the course of portal cirrhosis which is being carried out by Fleming at the clinic includes a study of the group of patients observed here from 1930 to 1937, inclusive. During this period, relatively less attention was paid to the matter of ascites and more to the maintenance of a high carbohydrate intake and to the improvement of the nutrition of the patient. There were 150 patients in Fleming's series of whom 128 are dead; the average duration of life after the appearance of ascites was about fourteen months, approximately the same as in the series studied by Chapman. Twenty-two of the patients in the more recently studied group are living, however, an average of almost six years after the first appearance of ascites. It is apparent from these two groups of figures that a not inconsiderable number of patients may survive even the more serious types of primary hepatic disease and that some ultimately regain a reasonably normal state of health. In both series of cases aforementioned, the greatest mortality appears to develop during the first six to twelve months after the appearance of ascites. Once this period has been passed the chances

for survival, or even ultimate cure, appear to be considerably improved.

Because of the comparatively encouraging interpretation which may be placed on these two statistical reviews, we have attempted to initiate the same type of program for our patients who have clinical hepatic disease, a program which has been used successfully for experimental animals poisoned with carbon tetrachloride. This, in brief, consists of feeding an adequate diet of a composition which is regarded as optimal for the normal regeneration of hepatic tissue. For use in clinical subjects, vitamin supplements have been added to this regimen for reasons which will be considered in later paragraphs. The diet which has been used is high in carbohydrate, low in fat and rich in proteins not derived from meat sources. The food value is approximately 500 gm. of carbohydrate, 110 gm. of protein and about 60 gm. of fat with a total fuel value of about 3000 calories. The protein component of the diet has been derived chiefly from vegetables, milk and egg white, meat being kept at a minimum. The reason for this change in the protein composition was based entirely on experimental evidence. It has been shown by Bollman² that, although animals with experimentally produced hepatic injury are made worse by the administration of meat or meat extracts, the administration of protein from other sources is without harmful effect.

Our interest in the matter of vitamin supplements was stimulated primarily by the observations of Patek¹³ who reported the effect of a high vitamin intake in a series of thirteen cases of alcoholic cirrhosis of the liver with ascites. Ten of these patients experienced remarkable improvement in respect to both clinical and laboratory findings; a few of the patients had spontaneous diuresis and the ascites disappeared. The vitamin supplements recommended by Patek, which we have used with various modifications, consisted of percomorphic acid (vitamins A and D), orange juice or pure ascorbic acid (vitamin C), Valentine's liver extract orally (as a source of riboflavin) or parenteral liver extract and yeast or a yeast concentrate plus thiamin chloride (to supply other portions of the B complex). In order to facilitate the absorption of the fat soluble vitamins, patients have been given 5 to 15 grains (0.3 to 1.0 gm.) of animal bile salts with meals.

Fleming has recently surveyed the results in a group of fifty cases in which this program was instituted during 1938 and 1939. The results are not entirely conclusive since hardly enough time has elapsed for the proper evaluation of this form of treatment. It appears, however, that about a half of the patients are living; about a third of the whole group are considerably improved and some appear to be making a complete recovery. This is a very satisfactory percentage of survival, especially since it includes patients treated during the critical first year after ascites developed. A few remarkable "cures" with disappearance of ascites have been encountered in this review, one of the most striking being in a man, aged seventy-two years, who after two years of almost weekly paracentesis has been free from ascites for one year and in good health. A number of patients have also made definite temporary improvement and later succumbed to hemorrhage from esophageal varices or from intercurrent infections. A review of the course of some of these cases indicates that the degree of improvement attained by the individual patient was to a great extent dependent on the regularity with which the program of therapy was followed.

These results and those previously reported by Patek are encouraging, especially because they concern a disease which has been regarded as virtually hopeless. It may be, of course, that coincidence and good luck have something to do with the matter. As Lennox has said of "cures" in cases of epilepsy, even the bloodiest of battles has thousands of survivors. The rationale of the therapeutic program has, however, something to recommend it. The dietary advised needs no defense, since all investigators of the clinical and experimental aspects of hepatic disease agree on its essential points. The use of vitamin supplements in large doses has recently been advised for almost all known ailments of human beings and their employment for hepatic disease may, of course, be referred to in the vernacular as "shot-gun" therapy or something worse. There is, however, a perfectly sound basis for this treatment in cases of hepatic disease which is not so widely known as it should be. The liver is a great storage depot for vitamins and perhaps for provitamins; its normally high content of vitamins A and D is well-known, as is the fact that it is one of the principal storehouses for vitamin C. It likewise stores the B

complex or at least certain portions of it, and is essential in the utilization of vitamin K to form prothrombin. It is natural to suppose that in hepatic disease of advanced degree a state of deficiency in respect to one or more of these vitamins may develop.

Since it has been learned that the liver may be concerned in the metabolism of vitamins, a search has been made for vitamin deficiencies that develop in the course of hepatic disease, especially cirrhosis. It has been found that these states of deficiency are neither so rare nor so poorly defined as one might expect. For instance, vitamin A deficiency as characterized by absolute night blindness has been noted several times; an excellent study of the subject made by Patek¹⁴ has shown that very large doses of vitamin A will gradually correct it whereas a diet that contains sufficient amounts of vitamin A to correct an ordinary deficiency state will not affect the condition. This observation implies that the ability of the cirrhotic liver to utilize vitamin A is definitely less than normal. Vitamin D deficiencies have also been demonstrated in hepatic disease chiefly as a form of osteoporosis; a few patients have been seen with advanced hepatic disease who show evidence of extensive loss of calcium from the bones. Disturbances of metabolism of another fat-soluble vitamin, the anti-hemorrhagic coagulation vitamin K, are well known and will be considered in a later paragraph. Defects in the utilization and storage of water-soluble vitamins are also apparent in certain cases. Deficiencies of vitamin C are rare; at least they seldom reach a degree sufficient to produce scurvy; but reductions in the concentration of ascorbic acid in the plasma and urine have been demonstrated. The relation of the B complex to cirrhosis requires consideration from a number of angles. It is, of course, a well-known fact that the patient with alcoholic cirrhosis has, ordinarily, subsisted on a diet deficient in the B complex. Recently, it has been shown by Rich and Hamilton that a diet adequate in respect to all its essential constituents and containing adequate amounts of thiamin chloride, nicotinic acid, riboflavin and vitamin B₆ was nevertheless capable of producing a marked cirrhosis in rabbits. Animals fed exactly the same diet but with yeast given instead of the various individual components of the B complex did not experience the development of hepatic lesions of any conse-

quence. In other words, a deficient intake of some unknown component of the B complex was capable of causing cirrhotic changes in the rabbit's liver. It is of interest to note in this connection that diets deficient in riboflavin will produce fatty metamorphosis of the liver in dogs, and that thiamin chloride (B_1) will maintain the liver glycogen of rabbits poisoned with carbon tetrachloride as well as favor normal regeneration (Hirata). When one examines the records of patients with hepatic cirrhosis for evidence of secondary B complex deficiencies, the typical clinical syndromes of peripheral neuritis, pellagra and cheilosis are found to be rare. Glossitis is occasionally noted but the oral lesions that one encounters in cases of pellagra are uncommon. Peripheral neuritis has also been observed; riboflavin deficiency (as characterized by cheilosis) has been observed by Jolliffe in the mouths of patients suffering from alcoholism and presumably from fatty changes in the liver. None of the usual clinical evidences of deficiency in vitamin B complex, however, are sufficiently marked to warrant attention for themselves alone and they are hardly numerous enough to indicate that ordinary types of avitaminosis-B play a significant part in the symptomatology of advanced hepatic disease.

There are, however, certain obscure and poorly understood features of portal cirrhosis which may have a bearing on the matter of deficiency of the vitamin B complex. It is now generally held that the liver has a very important rôle in the handling of thiamin. A few attempts have been made to determine whether or not normal storage of thiamin chloride obtains in persons who have cirrhosis; the results so far are not entirely conclusive but it does appear from the recent report of Robinson, Melnick and Field that patients with advanced hepatic injury have a low urinary output of thiamin and that they respond to a test dose of the material in a manner indicative of impairment of storage.

With pellagra, which represents a chronic form of deficiency of nicotinic acid, it is not uncommon for the urine to contain an abnormal concentration of porphyrin. There is a comparable large excretion of porphyrin after exposure to various hepatic and general poisons, notably alcohol.⁴ Porphyrinuria is common in hepatic disease and during episodes of hepatic insufficiency the amounts of porphyrin in the

urine may increase materially. This analogy with the state of affairs existing in the pellagrous subject suggests that a possible deficiency of nicotinic acid may enter into the production of certain symptoms of hepatic disease.

It should also be recalled that encephalopathic states have been seen associated with nutritional deficiencies which respond in a specific manner to the administration of nicotinic acid (Jolliffe). Various types of cerebral disturbances, of course, have been seen in both acute cases of pellagra and in acute cases of alcoholism. A somewhat similar type of disturbance of the central nervous system (coma hepaticum) may be seen in the course of hepatic cirrhosis; the condition is characterized by mental confusion progressing to deep stupor and muscular spasticity and evidences of cerebral irritation are associated features. At least three such patients in hepatic coma have been observed to respond in a striking manner to the continuous intravenous administration of glucose with large doses of thiamin chloride (100 to 150 mg.) and nicotinic acid (250 mg.). Whether such large doses are necessary is, of course, debatable but the results in the few cases studied have not been obtained from the therapy (glucose, oxygen) previously used. It may seem, at the moment, of little advantage to be able to revive a patient from hepatic coma and then be unable to prevent his death from some other form of hepatic insufficiency; however, patients have been known to survive one or more attacks of coma for long periods of time. One cannot, of course, draw conclusions from these isolated observations as to the effects of nicotinic acid and thiamin chloride but they are not entirely without significance.

There is one final reason to justify the use of the vitamin B complex and its various constituents for cirrhosis. Patients who have this disease derive an abnormally large proportion of calories from carbohydrate and therefore, presumably make unusual demands on the various enzyme systems which assist in the breakdown of glucose. Two of these enzymes (co-enzymes) which are active in the metabolism of glucose, are the phosphopyridine nucleotides, each of which contains a molecule of nicotinic acid. These are believed to be concerned with the metabolism of hexosephosphate. It has been established that this enzyme system is exhaustible; in fact, there is evidence to indicate that a high carbohydrate diet

will exaggerate a deficiency of nicotinic acid for this reason. Another stage of glucose metabolism which is affected by an analogous enzyme system is the breakdown of pyruvic acid. The co-enzyme in this reaction (cocarboxylase) is the pyrophosphate of thiamin. It has long been known that thiamin depletion is easily attained and that the process may be hastened by a pure carbohydrate intake (at least in some experimental animals). Finally, riboflavin enters into the composition of the Warburg-Christian respiratory enzymes which are active in cellular oxidation reactions. Thus, there are three enzyme systems dependent for their functional activities on constituents of the B complex. If storage of these various fractions of the vitamin B complex is reduced by hepatic disease and if the diet used in the treatment of the disease makes unusual, if indirect, demands on these fractions, it is logical to attempt to supply them in increasing amounts. In actual practice our attempts to apply this principle, especially to the care of patients who have acute hepatic damage and patients who have evidence of hepatic insufficiency in the postoperative state, have been productive of some encouraging results.

The Control of Hemorrhage from Esophageal Varices

One of the most feared complications in the course of chronic hepatic disease is the rupture of an esophageal varix. This accident is one of the leading causes of mortality in cases of atrophic cirrhosis and is all too frequently responsible for the death of a patient who may otherwise be making good progress. No entirely satisfactory means of dealing with these varicosities, which because of their situation are peculiarly vulnerable, has yet been devised. Omentopexy may possibly serve to divert some of the blood from these channels and thus reduce the chances of rupture; direct ligation of the coronary veins of the gastrohepatic omentum and even splenectomy have a similar and more direct chance of accomplishing a similar reduction in blood flow. The risk of the performance of all these procedures and the technical difficulties of the last two have militated against their general use.

For some time, the suggestion has been made that direct injection of these varices through the esophagoscope be considered but, until recently,

no successful procedure of this type has been reported. In 1939, Crafoord and Franckner of Stockholm reported the successful treatment of varices in this way and, more recently, H. J. Moersch has treated a patient in this manner. In the case which he described the varices were of such a size as to occlude almost completely the lumen of the gullet. After four injections of a 2.5 per cent solution of sodium morrhuate, the veins were greatly reduced in caliber and showed evidence of local thrombotic processes. The lumen of the esophagus had returned to almost normal caliber and the mucous membrane was distinctly less congested. It seems likely that treatment of this type may prove to be the most satisfactory method of controlling bleeding from the esophageal vessels.

The relationship between vitamin K and the hemorrhagic diathesis of hepatic disease is now well-known. The condition depends on a deficiency in prothrombin which in turn is not so much due to a lack of vitamin K as to a primary inability of the liver to form prothrombin even if adequate amounts of vitamin K are available. Prothrombin deficiencies have been produced experimentally by intoxication with chloroform and by partial hepatectomy. In the clinical field, analogous prothrombin deficiencies have been seen in cases of subacute and acute atrophy of the liver and in portal and biliary cirrhosis. Early attempts to manage such deficiencies in the same manner as had been found effective in cases of obstructive jaundice, that is, with vitamin K and bile salts, were found to be almost totally ineffective in some cases and only partially successful in others. This has also been the experience of other investigators.

With the introduction of the various naphthoquinone derivatives that exhibit vitamin K activity, it was hoped that this difficulty could be overcome and that, with the aid of these potent materials which could be administered parenterally, the prothrombin deficiency of primary hepatic disease could be corrected. This hope, however, has not been realized; even the use of the most active material employed to date (2-methyl-1, 4-naphthoquinone) has failed to control entirely the condition. This compound, and others of similar chemical composition, may, however, maintain the level of prothrombin at a point sufficiently high to prevent gross bleeding even in the presence of advanced hepatic injury.

The patient may thus be tided over a period of danger until time has been allowed for regeneration of hepatic cells. Bollman¹ has noted that a high carbohydrate intake enhances the protective effect of these quinone compounds to a considerable extent. The use of naphthoquinones along with every reasonable effort to expedite the process of liver regeneration may be expected to save a considerable number of patients from a fatal prothrombin deficiency. Failures are to be expected but at least partial control of the hemorrhagic state is now possible.

Summary

The experimental and clinical evidence cited indicate that the possibilities of survival or clinical cure in cases of primary chronic hepatic disease are not inconsiderable. One may suggest that the poor therapeutic results noted by earlier observers were due to the practice of limiting the diet, purging and administering diuretic remedies of various kinds. The scheme of treatment now advocated is based entirely on an attempt to secure optimal conditions of nutrition for the patient and to provide all vitamins in sufficient quantities to ensure adequate supplies for all enzymatic and cellular activities that are necessary to health. Until more is known of the specific requirements for the various "protective substances" in the presence of injury to the liver, such treatment will necessarily be on an empiric basis. The many studies on vitamin metabolism in respect to the liver which are being reported lead one to believe that there may be certain

specific features of hepatic disease which will respond favorably to certain known components of vitamins. Much further study will be required to establish the soundness of the present plan of therapy; in the meantime it may be offered on the basis of its comparatively favorable record and because no other therapeutic attack offers as good a prospect for success.

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A PRELIMINARY SURVEY OF THE ANOPHELINE MOSQUITO FAUNA OF SOUTHEASTERN MINNESOTA AND ADJACENT WISCONSIN AREAS*

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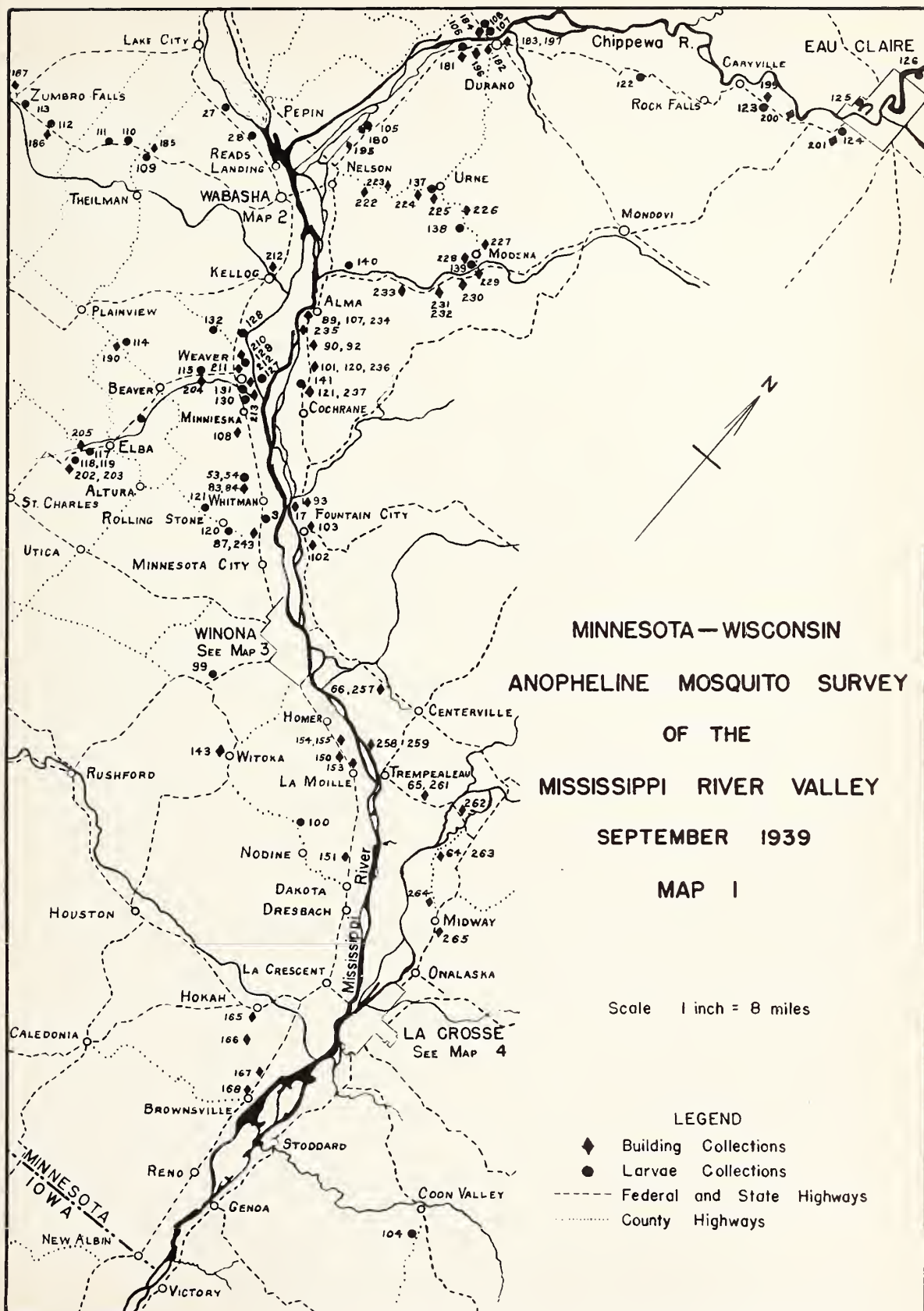
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DESPITE common belief that malaria does not occur in Minnesota and Wisconsin, it is well known to those in touch with the situation that locally acquired cases occasionally present themselves. There is current an impression that such cases are on the increase since the installation of the dams for improvement of navigation along the Mississippi River. The increasing

number of cases of the disease reported to the Minnesota and Wisconsin State Health Departments would seem to afford some evidence in support of this view.

In Minnesota there were reported for the three seasons 1935-1937, inclusive, a total of nineteen cases, of which seven were clearly indigenous and two others presumably so. In 1938 there were eight reported cases, of which three were indigenous. In 1939 there were recorded twenty-

*This paper embodies partial results of a coöperative study made with the aid of the U. S. Public Health Service, by the Minnesota and Wisconsin State Health Departments, covering the period August 25 to September 26, 1939.



two cases. Parallel conditions prevailed in Wisconsin where there was reported for the three seasons 1935-1937 a total of twenty cases, of which twelve were indigenous. In 1938 there were seven reported, of which five, occurring in cities bordering the Mississippi River, were indigenous. In 1939 the number of reported cases reached twenty-eight.

Associated in the work were Harold Peters, H. Laurence Burdick and Robert Dicke, without whose efficient aid the scope of the work would have been greatly restricted. Acknowledgements are also due Mr. Theodore Olson, Biologist of the Minnesota State Department of Health, who kept in close touch with the studies and who, as did Mr. Peters, made numerous photographs illustrating typical breeding places.

Four species of anophelines, each a potential malaria carrier, occur in Minnesota. These are *Anopheles maculipennis*, *A. punctipennis*, *A. quadrimaculatus*, and *A. walkeri*. Data regarding their incidence and distribution are few, as compared with those relating to other insects of economic importance. In view of the awakened interest in malaria, Dr. A. J. Chesley, Secretary and Executive Officer of the Minnesota State Board of Health, in August, 1939, suggested to Dr. C. A. Harper, State Health Officer of Wisconsin, that an intensive survey be made of the anopheline fauna along the Mississippi River, on both sides, from Wabasha, Minnesota, to La Crosse, Wisconsin. Late as the season was, it was evident that important data relative to the incidence and breeding habits of the various species might still be obtained.

The project and the necessary expenditures of federal funds were promptly approved and equipment assembled. On August 26 a general survey of the area under consideration (see map) was made to determine the most favorable location for the field laboratory. Ready access to a bridge, to boats, and to typical flooded areas on both sides of the Mississippi led to the selection of Wabasha, Minnesota, as headquarters for both the Minnesota and the Wisconsin field workers. A cabin adjacent to a considerable swampy area was available and intensive work was begun on August 27.

Methods of Work

In so far as the limited time permitted, four main lines of work, as follows, were carried out:

1. *Building collections* were made over as

many scattered localities in the area as was feasible. Regardless of species, mosquitoes resting in sheds, outdoor privies, bath houses, basements, and similar shelters, were collected by the use of an aspirator. Search was also made beneath bridges and culverts. The total collections were counted and the anophelines identified.

2. Collection of anophelines attacking the workers was carried out to only a limited degree.

3. *Light trap catches*, utilizing the available two and, for a part of the time, three of the well-known New Jersey electrically controlled mosquito traps, were made during the entire period of the survey.

4. *Larval collections* were particularly emphasized, with a view to determining the extent of favorable breeding places. To insure correct identifications the specimens were usually bred out.

The survey was most fortunate in securing, through the courtesy of the District Engineer, U. S. War Department, a set of the maps prepared in connection with the river improvement project. These consisted of key maps to the various regions in the valley as well as a number of detailed maps showing areas of marsh, open water, flood plain forest, streams, et cetera, on a large scale. Although various changes have occurred in the course of completion of the dams, the maps were invaluable aids for the field studies.

Records of temperature and other weather conditions were kept throughout the work. These and other details will be filed for future reference and additions.

September weather in Minnesota is very undependable and the group was fortunate in having a full month, August 27 to September 27, of practically uninterrupted field work. According to the Weather Bureau monthly summary the mean temperature for September was 69.1° F., a departure of +6.6°.

Collections from Buildings and Other Shelters

In the course of the work, mosquitoes were taken from many kinds of diurnal resting places. These included privies, basements, sheds, bath houses, bridges, culverts, cattle underpasses and other shelters. All resting mosquitoes, including the non-anophelines, were collected from as many different localities in the area, as time per-

mitted. Of the 12,321 specimens thus secured, 11,798, or 95.7 per cent, were anophelines.

As illustrative of the conditions in buildings, exclusive of other shelters, we may consider the results at Wabasha, where collections were made daily in the basement of the field laboratory and in each of three outdoor privies near the laboratory.

For the period August 27 to September 26, 1939, there were 4,853 mosquitoes collected from these four stations. Of the total, only 79, or 1.6 per cent, were non-anophelines.

There were 4,774 anophelines, or 98.4 per cent, of the total catch. These were distributed as follows:

<i>Anopheles quadrimaculatus</i>	4,500	94.4%
<i>A. punctipennis</i>	262	5.4%
<i>A. walkeri</i>	12	0.2%
<i>A. maculipennis</i>.....	..	..

The enormous preponderance of *A. quadrimaculatus* in building collections was clearly indicated from the outset but was quite at variance with such distribution records as were available in the entomological collections of the University of Minnesota. Such records indicated a probable greater incidence of *A. punctipennis* in southeastern Minnesota. As we shall see, this was due to the fact that most of the previous collections had been made at points not on the Mississippi.

Examination of the detailed report of collections shows that there was a daily influx of anophelines and particularly of *quadrimaculatus* into these buildings. Even though removed daily, large numbers were always present the following morning. Thus, on the morning of September 3, 243 specimens were captured in the basement, although it had been cleared carefully the day before. On September 16, 231 specimens of *quadrimaculatus* were collected from one of the privies.

The picture is essentially the same when the total collections of 11,191 mosquitoes from buildings and other resting places throughout the river valley area are considered. The anophelines constituted 95.9 per cent of the catch and of these *quadrimaculatus* represented 91.7 per cent.

A significant contrast is afforded by the collections made in the surrounding hills and valleys, outside of the river valley proper. In these localities, referred to in subsequent discussion as "inland," there were taken 1,130 adult specimens from resting places comparable to those searched

in the river valley. Again the anophelines were dominant, being represented by 1,070 specimens, or 94.7 per cent. The distribution of species was strikingly different from that found in the river valley. *Punctipennis* led with 917 specimens, or 85.7 per cent, while *quadrimaculatus* was represented by only 151, or 14.1 per cent, as compared with the total of 94.7 per cent found in the river valley collections from similar shelters. *A. walkeri* and *A. maculipennis* were represented by a single specimen each.

These findings agree with previous records indicating that *punctipennis* is the most common widely distributed anopheline in southern Minnesota. It breeds by preference in spring-fed streams and pools among the hills of this region, a fact which is in agreement with the known habits of the species.

While there is ample evidence to support the view that *quadrimaculatus* is the chief carrier of malaria in the southern United States, there should be further investigation before it is concluded that it plays an equally important rôle in Minnesota. As bearing on this question it should be noted that most of the dwelling houses in the area are well screened and that *walkeri*, also an efficient carrier, readily attacks man in the open, even in mid-day, in bright sunlight.

Anophelines Caught While Attacking

Throughout the survey specimens of anophelines feeding on man in the open were collected. Unfortunately time did not permit extensive collecting of this type and the following data represent occasional catches during the course of other work. On three occasions a definite attempt was made to obtain feeding records.

Of the total catch of 134 mosquitoes *quadrimaculatus* supplied sixteen, or 11.9 per cent. *A. walkeri* was represented by 114, or 85.1 per cent, *punctipennis* by four, or 3 per cent, and no specimens of *maculipennis* were so taken.

Of the 114 *walkeri*, fifty-five were collected when a definite effort was made to obtain feeding records. These collections were made on three successive days.

Obviously the data on feeding habits are so meager as to be merely suggestive. However, the preponderance of *walkeri* was also noted in similar catches of feeding mosquitoes made by William Chalgren, in 1938, in the Minneapolis-St. Paul area. Of 4,166 specimens, representing

ANOPHELINE MOSQUITO—DAGGY, MUEGGE AND RILEY

TABLE I. SUMMARY OF LIGHT TRAP CATCHES AT WABASHA, MINNESOTA

August 26-September 25, 1939

	LIGHT TRAP A		LIGHT TRAP C		LIGHT TRAPS A AND C	
<i>Anopheles quadrimaculatus</i>	632	18.2%	1,061	74.4%	1,693	34.5%
<i>Anopheles punctipennis</i>	493	14.1%	130	9.1%	623	12.7%
<i>Anopheles walkeri</i>	2,357	67.7%	234	16.4%	2,591	52.8%
<i>Anopheles maculipennis</i>	..	..	1	..	1	..
Total Anophelines	3,482	100.0%	1,426	100.0%	4,908	100.0%
Total Anophelines	3,482	22.0%	1,426	21.3%	4,908	28.1%
Total Non-Anophelines	12,322	78.0%	5,272	78.7%	17,594	71.9%
	15,804	100.0%	6,698	100.0%	22,502	100.0%

twenty-one species, *walkeri* was the only anopheline, and of it forty-seven specimens were taken. The relative frequency with which it occurred in trap catches also indicates that it may be more important than ordinarily has been considered.

Light Trap Catches

Three electrically controlled mosquito traps of the New Jersey type, which has become standard for mosquito survey work, were available and two of them were in use for the entire period, at Wabasha. The third was operated for a five-day period at La Crosse, Wisconsin.

Of those in use at Wabasha, trap "A" was suspended in an apple tree close to the laboratory, on a ridge overlooking an extensive mosquito-breeding swamp (Fig. 1). Trap "C" was located in a back yard in the residential district known as West Wabasha.

From trap "A" 15,804 mosquitoes were taken during the period August 26 to September 24 (Table I). Of these 3,482, or 22 per cent, were anophelines, the percentage in the daily catches ranging from four on August 29, to a high of 51.4 on September 18.

The total daily catch as well as the percentage of anophelines varied. On two occasions, no mosquitoes were collected. This occurred on September 23 and again on September 25, when the light trap studies were concluded because of cold weather.

The largest single catch occurred on the night of September 15 when 2,264 mosquitoes were collected. Of these, 740, or 30.6 per cent, were anophelines. This record catch was made at the hottest period of the survey, a situation noted by other workers using light traps in sampling mosquito populations in other regions. Examination of the humidity records did not show any definite effects due to variations in this factor.

When one considers the distribution of the species captured by trap "A," he is immediately struck by the preponderance of *walkeri*, which is generally referred to in literature as an uncommon species. In the course of the month during which this trap was operated, 2,357 specimens of *walkeri*, or 67.7 per cent of the total anophelines, were taken as contrasted with 632, or 18.2 per cent of *quadrimaculatus*. It is the more striking in view of the fact that the trap was hung in the location where such large collections of *quadrimaculatus* were made in buildings. That it was not due to failure of the traps to attract the latter is evident when it is noted that the condition was almost completely reversed with trap "C," where 74.4 per cent were *quadrimaculatus* and only 16.4 per cent were *walkeri*. When the catches of the two traps are combined it is seen that a little over half of the anophelines were *walkeri*, around one-third *quadrimaculatus* and an eighth *punctipennis*.

Trap "C," instead of hanging in the open, near the edge of an extensive breeding place, as was trap "A," was in a yard with crowded shrubbery, in a residential district. The total number of mosquitoes caught here during the season was 6,698 compared with 15,804 at "A." It is interesting to find that the percentages of anophelines were almost identical—22 for trap "A" and 21.3 for "C."

In the absence of more complete data it is difficult to explain these differences in the catches from the two traps, located only two miles apart. They were identical in construction and light bulbs of the same intensity were used. Breeding conditions for anophelines were more favorable in the surroundings of trap "A," but also existed more remotely within range of "C." That *quadrimaculatus* was present in abundance in the former locality is shown by the fact that 4,500 speci-

mens were collected from the basement and the three outbuildings routinely inspected. Unfortunately only meager indoor collections were made in the region of "C" and hence comparisons between the two areas in this respect are not possible.

The discrepancies in the performance of the two traps serve to emphasize a fact well-known to workers accustomed to their use—it is not safe to rely on one or two traps to give a true picture of the mosquito fauna of a region. Care must be taken to select different significant locations or carefully to select comparable areas if information concerning their relative breeding is sought.

While more extensive collections from buildings might have cleared up the discrepancies in the data relative to catches of *quadrifasciatus*, there remains the more puzzling question as to the reason for the great numbers of *walkeri* taken with trap "A" as compared with those from "C." Earlier studies had convinced us that the species is common in Minnesota and that it feeds readily in the open, at any time of day.

That *walkeri* is not a household mosquito is indicated by the fact that only twelve specimens were included in the routine collections from buildings at Wabasha. It seems probable that it does not penetrate into residential districts as readily as does *quadrifasciatus* or is more restricted in its flight from breeding places. However, the fact that *walkeri* may overwinter in the egg stage (Matheson and Hurlbut, 1937; Hurlbut, 1938) might account for its being less attracted to houses during the period covered by this survey.

Light trap collections in the Minneapolis-St. Paul area as well as our experience with trap "A" suggest that *walkeri* may more readily be attracted to lights than are the other anophelines in this region. Johnson (1936) found that from 15 to 50 per cent of the anophelines caught by a light trap at Reelfoot Lake, Tennessee, were of this species, although it was very scarce in collections from buildings and in the larval surveys.

It is evident that further studies of the biology, distribution, and incidence of *A. walkeri* are highly desirable, particularly since it is known to be capable of transmitting both *Plasmodium vivax* (experiments of Matheson, Boyd and Stratman-Thomas, 1933) and *Plasmodium falciparum* (experiments of Kitchen and Bradley, 1936). Recently Bang, Quinley and Simpson,

1940, reported finding a wild-caught specimen harboring malarial parasites. The salivary glands were heavily infected and six oöcysts were found on the stomach.



Fig. 1. (above) Trap "A" and a portion of the extensive swampy area below the laboratory at Wabasha, Minnesota. Photo by Harold Peters.

Fig. 2. (below) Backwater area with algal mats in which anophelines were breeding in numbers, near the field laboratory. Photo by Harold Peters.

The above-discussed light trap data relate to conditions at Wabasha, Minnesota, where the two traps were run throughout the entire period, August 26 to September 25. A third trap of the same type was operated at La Crosse, Wisconsin, for the five-day period September 12 to 16, during which larval surveys and building collections were being made in the vicinity. The trap was located on the edge of the main channel of the Mississippi river, on La Plume Island. A total of 1,751 mosquitoes was collected here—less than that of either of the Wabasha traps for the same period. Of this total, *walkeri* was by far the most abundant anopheline, constituting 84.7 per cent of the 483 taken, while *quadrifasciatus* made up 15.1 per cent. A single specimen of *punctipennis* was included in the catch.

For purposes of comparison the catches of the La Crosse and the two Wabasha traps for the same five-day period are given in Table II. Since the La Crosse trap was in a position somewhat similar to that of trap "A" at Wabasha, the

TABLE II. A COMPARISON OF THE LIGHT TRAP CATCHES AT LA CROSSE AND AT WABASHA FOR THE FIVE-DAY PERIOD SEPTEMBER 12-16, 1939

	LA CROSSE		LIGHT TRAP A		LIGHT TRAP C	
			(Wabasha)		(Wabasha)	
<i>Anopheles quadrimaculatus</i>	73	15.1%	290	16.6%	478	75.8%
<i>Anopheles punctipennis</i>	1	.2%	249	14.3%	43	6.8%
<i>Anopheles walkeri</i>	409	84.7%	1,206	69.1%	110	17.4%
<i>Anopheles maculipennis</i>	..	..	..	..	..	..
Total Anophelines	483	100.0%	1,745	100.0%	631	100.0%
Total Anophelines	483	27.6%	1,745	35.4%	631	26.6%
Total Non-Anophelines	1,268	72.4%	3,191	64.6%	1,740	73.4%
	1,751	100.0%	4,936	100.0%	2,371	100.0%

catches of the two might be expected to be very comparable. The percentages of *quadrimaculatus* were almost identical. *Punctipennis*, with its single representative, was practically lacking in the La Crosse catch, while *walkeri* was even more predominant than at Wabasha, Trap "A."

In view of this close agreement it is apparent that the anopheline populations at the two extremes of the surveyed area are very much alike. It is believed from these and supplementary studies that the entire valley between these points would yield similar results if the mosquito populations were similarly sampled.

Larval Survey

Most of the actual time for the month of the survey was spent in the field locating important anopheline breeding places. The surveys were more or less centered at Wabasha, Reads Landing, Winona, and La Crosse, which, as seen by the map, afforded typical conditions for the river valley. Some collections were made at additional points of interest and two days were devoted to inland surveys, away from the valley proper.

A total of 102 collections of anopheline larvæ were made in the river valley, the larvæ being taken to the laboratory and usually reared. No mosquitoes were reared from thirteen of the collections, in most of which the anophelines were not abundant and such as were present were in early instars. For the other eighty-nine collections, adults in numbers were recovered. Detailed records were kept as to the stations studied, the typical vegetation, the amount of shade or exposure, presence of fish and other significant data. These and the field notes are on file and will serve as a basis for more extended work in the future.

The anopheline larvæ were generally found in clean, quiet waters with abundant vegetation.

Sloughs, sluggish streams, impounded waters behind wing dams and similar situations all through the surveyed area were favored breeding places. Dense tangled thickets of submerged *Ceratophyllum*, *Myriophyllum* and occasionally of *Potamogeton* with algal mats of *Spirogyra* and, more often, of *Hydrodictyon* (Fig. 2) were particularly favored by *quadrimaculatus* and *punctipennis*. Scattered over these areas there were often the duckweeds *Lemna* and *Wolffia*, but when they were present to the extent of thick, almost solid, layers, the larvæ were not present in numbers. As was to be expected, situations where vegetation was not abundant, and the water was deeper, and accessible to fish, yielded few anopheline larvæ.

All four species were obtained in these larval collections. Of a total of 948 reared, 544, or 57.4 per cent were *quadrimaculatus*. Second was *punctipennis* with a total of 366 reared adults, or 38.6 per cent. *Walkeri* was represented by only thirty-seven reared adults, or 3.9 per cent and *maculipennis* by a single one.

From these data, obviously very meager and based on restricted seasonal collecting, it would appear that *quadrimaculatus* and *punctipennis* are the most common two anophelines breeding in the sloughs and impounded waters in the valley. Of the eighty-nine larval collections, thirty-four yielded adults of both species, while twenty yielded only *punctipennis* and twenty-two *quadrimaculatus*. It should be pointed out that only one or two adults were reared from many of these latter samples.

How this condition compares with what existed before the installation of the dams cannot accurately be determined. The whole area was swampy and subject to overflow, affording many favorable breeding places for breeding of *quadrimaculatus* especially. However, much of the

swamp was covered by trees which were removed in the course of the river improvement program and this exposure to light rendered it more attractive to the anophelines. It is highly probable that there is greatly increased breeding by *quadrimaculatus* in the river valley.

Relative to *walkeri* there are a number of puzzling questions which can be answered only by further detailed studies. As we have seen, it was by a very wide margin the dominant species taken in light trap "A" and at La Crosse, both of which were located near marshy breeding areas and not in residential districts as was trap "C." It was also the species most frequently taken while attacking man. Why was it represented only to the extent of 3.9 per cent in the larval collections?

The most obvious answer to this question would appear to be that the particular breeding places favored by *walkeri* were overlooked in the larval survey. This may be the case although the larval survey was most intense in the Wabasha area and particularly in the area from which trap "A" attracted mosquitoes. It seems improbable that any important concentrated breeding area of *walkeri* would be overlooked, especially when all types were being examined here from the beginning of the survey. Another possibility is that the favorable breeding period for *walkeri* had passed before the survey began. Of this we have no evidence, beyond indications, that the species overwinters in the egg stage in the North, in which case the summer broods would have already completed their development and no larvæ would be hatching.

Such limited data as are at present available suggest that *walkeri* favors flooded grassy areas in shallow water for breeding. These areas were on some occasions cut grass, but probably included sedges and rushes as well. In most cases these stations were rated as poor because larvæ were not abundant. However, these grassy areas do cover large extents of bottom land and even though *walkeri* larvæ are sparsely scattered over them, the total emergence might be very great.

If this proves to be the breeding habit of *walkeri*, it affords one explanation of the species being obtained so infrequently in the larval survey. With the time strictly limited, the area to be examined very extensive, and the possibility of weather conditions limiting the survey, each collecting stop was brief and if no larvæ, or a very few, were found, the collectors moved on to an-

other station. This resulted in emphasis on areas where larvæ were concentrated. Thus, if *walkeri* does not breed in concentrated areas as do *quadrimaculatus* and *punctipennis*, it would very likely be missed.

This may also account for difficulties others have experienced in locating the breeding places of the species. Bradley and McNeel (1935) in Florida and Johnson (1936) in Tennessee, found *walkeri* readily attracted to light traps but also had great difficulty in locating breeding places. Johnson reared only one adult from all nearby breeding places, while Bradley collected only eight larvæ.

In order to learn how extensively the four species of anophelines occurred elsewhere in the general region, two days were spent in a survey away from the river valley. The topography of these areas of southeastern Minnesota and corresponding sections of Wisconsin is rough and hilly. Much of it is unglaciated and hence drainage is well developed, with no ponds, lakes, or marshes to serve as mosquito breeding places. The only favorable places are springs, spring pools, seepage pools and small clear streams. In all of these locations larvæ were found in numbers.

By far the dominant species in the whole range of differing habitats was *A. punctipennis*, which constituted 98.8 per cent of all the anophelines reared from these inland collections. The remaining 1.2 per cent consisted of thirteen *quadrimaculatus*. The latter were all reared from static water while *punctipennis* alone was found in all the streams and springs examined. The streams were usually rather small, clean, with sand bottoms and a marginal fringe of green filamentous algæ. In this fringe *punctipennis* larvæ were always found, in numbers. Many were observed on the very edge of the algal margins, moving back and forth in the currents. On many occasions the larvæ were so numerous that they could easily be collected in a teaspoon. In a number of places, twelve to fifteen could be obtained in a single teaspoonful.

Summary

In considering the results of this preliminary survey, it should again be emphasized that it covered a period of only one month, beginning the 26th of August, 1939. The weather conditions were unusually favorable, the mean temperature for the month being 69.1, which was 6.6° F.

above the average. It did not fall below the freezing point during the month—a very unusual circumstance.

Under these conditions it is probable that the anopheline populations were at their peak. The situation is complicated, too, by the fact that the hibernation periods for the various species were approaching. No data were available regarding the early mid-season conditions.

The findings for the period of the survey, August 26 to September 25, may be summarized as follows:

1. Anopheline mosquitoes were found to be much more abundant in the Mississippi river valley, from Wabasha, Minnesota, to La Crosse, Wisconsin, than had previously been supposed.

2. Four species of anophelines already reported for Minnesota were found: *quadrimaculatus*, *walkeri*, *punctipennis*, and *maculipennis*. *Maculipennis*, which occurs commonly in northern Minnesota, was so rare as to indicate that it is of no significance in the survey area.

3. On the basis of building collections alone, where it constituted 91.7 per cent of the anopheline catch, *quadrimaculatus* would appear to be the most common species in the valley proper, while *punctipennis* with its 85.7 per cent was the most abundant inland. *Walker*i was almost absent in these collections, although there is reason to believe that it may be the most common of the four.

4. In light trap collections in the residential district of Wabasha *quadrimaculatus* was present to the extent of 74.4 per cent while in the catches by traps located near extensive swamp areas at both Wabasha and La Crosse *walkeri* made up 67.7 per cent and 84.7 per cent, respectively, of the total anophelines.

5. In the small collection of anophelines attacking man in the open, *walkeri* was the dominant species. This is in agreement with observa-

tions elsewhere in Minnesota, and emphasizes the need for detailed studies on the biology of the species.

6. Anophelines were breeding abundantly throughout the valley in the extensive sloughs and backwaters. Larval collections yielded 57.4 per cent *quadrimaculatus* and 38.6 per cent *punctipennis* in these situations. Such evidence as is available indicates that *walkeri* oviposition is less concentrated but that it occurs in submerged grassy areas which are extensive in the region. An alternative is that the favorable season for larval development of the species had passed.

7. Data from collections from buildings, from light traps, hand catches, and larval collections revealed a surprisingly high incidence of anophelines, with *quadrimaculatus* and *walkeri* the dominant species. While there are no data relative to the abundance of these species prior to installation of the flood control dams, there is evidence that there has been a marked increase in favorable breeding places in the river valley for *quadrimaculatus* and apparently for *walkeri*, as well.

8. In the inland, in contrast to conditions in the river valley proper, *punctipennis* was the only anopheline found breeding in numbers. It constituted 98.8 per cent of the specimens reared from the inland collections.

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SCHIZOPHRENIA IN CHILDHOOD*

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IN 1863 Kahlbaum isolated the mental disorder hebephrenia and in 1869 catatonia. Kraepelin, in 1896, united these two and the paranoid types into his concept dementia præcox and differentiated it from manic-depressive psychosis. As the disease does not always progress to dementia or appear precociously, at or soon after puberty, in 1911 Bleuler proposed the more accurately descriptive name schizophrenia. He considered a splitting and dissociation of the personality to be the fundamental symptom of the disease. Freud postulated that schizophrenia represents a fixation at the auto-erotic stage of development and is a narcissistic regression psychosis. Meyer regards schizophrenia as the reaction of a maladapted individual whose principal fault is a persistent misapplication of his instincts. Campbell² has defined the disorder as follows: "The schizophrenic type of reaction seems to be characterized by diminished interest in, and adaptation to, the work-a-day world, increased interest in subjective creations or phantasies which are emancipated from the control of ordinary logical or scientific thought, the frequent occurrence of hallucinations, odd and fragmentary behavior and utterances of little adaptive value in relation to the present situation."

The nervous system in the child is physiologically immature. His intellectual development and life experiences are comparatively limited. Therefore, Potter⁹ states, children are essentially beings of feeling and behavior. Their language is restricted and hence they cannot fully verbalize their feelings. Consequently their psychopathology is expressed largely through distorted affective responses and altered behavior reactions.

All normal children live in their phantasies to a greater or lesser degree and the schizophrenic reaction is often likened particularly to the child at play. But according to Creak⁴ these phantasies and vivid imaginations, ritualistic play, emotional instability, and other similar immature thought and conduct may be distin-

guished from a psychosis in the making by the early age of the patient, the temporary nature of the activity, and the fact that it may be understood. Manic-depressive psychosis in children is very rare indeed, arises only close to the time of puberty, and in the long run generally proves to be a schizophrenic reaction.

Cleland³ maintains that the different types of schizophrenia have characteristic conduct disorders in childhood. Listless, lazy, tired-out attitude toward life presages the simple or hebephrenic type. Incoherent conduct and much activity without accomplishing anything foretells the catatonic type. But both prototypes may be characterized by irritability, periods of excitement and depression, mannerisms, and conduct peculiarities. Lutz⁸ describes two types of schizophrenia in children, one slowly progressive without marked remissions and the other type often with catatonia, of rather sudden onset, and with definite exacerbations. However, any of these symptoms may be found in a normal child and differentiation of the various types of schizophrenia in children is practically impossible.

The schizophrenic is the odd, queer, or different child in the family and one is unable to really contact him. Richmond¹⁰ says that in comparison the psychopathic child has some semblance of rapport and, furthermore, is cunning and possesses self-defensive instincts. He impresses one as capable if he would only apply himself whereas the schizophrenic impresses one as dull or defective. However, apparent dullness in a psychotic child is probably inattention due to his preoccupation rather than lack of comprehension.

The schizophrenic child may be differentiated from the mental defective by the fact that in the defective walking, and especially talking, motor coördination, and all learned reactions are greatly delayed. Consequently the psychotic child is likely to show some initiative even in devising varieties of his abnormal behavior. Finally, an intelligence test may provide a differential diagnosis between schizophrenia and mental deficiency. Lay⁶ summarizes the differences as fol-

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lows. In schizophrenia the patient shows scattering of responses through several age levels, does better on verbal than performance tests, does not react to urging or praise, improves on retest, and his intelligence quotient will not be noticeably low. In mental deficiency all these points are the reverse.

Schizophrenia is a psychosis of psychogenic origin without clearly defined tangible cause or structural change. Schilder¹¹ aptly emphasizes that pictures which resemble schizophrenia in childhood are very often schizoid reactions to organic processes or defects of the brain. Dementia precocissima and dementia infantilis, referred to in the foreign literature as forms of schizophrenia, really are not schizophrenia at all but primarily organic processes. Similarly, propf-schizophrenia is not a functional entity but rather is a schizoid reaction appearing in and incident to an oligophrenia.

The principal definite etiological factors in 151 cases of schizophrenia studied by Bowman and Kasanin¹ were environmental stress in 81 per cent and heredity in 64 per cent. It would seem that heredity does not predispose to any one type of psychosis but rather to an early mental breakdown. A primary psychic factor, a predisposition, may be the basis for mental disease; Jung termed an individual so conditioned to developing schizophrenia an introvert.

Schizophrenia constitutes about 25 per cent of all the psychoses. The number reported in childhood before the physical appearance of puberty is very small. The ages of those cases reported range from 3 to 16 years. Bleuler took 15 years as the dividing line and said 4 per cent of his cases had symptoms of schizophrenia before that age. Kraepelin, in 1913, reported a series of 1,054 dementia præcox patients of whom 3.5 per cent developed symptoms before ten years of age.

In about 6,000 admissions to the Boston Psychopathic Hospital from 1923 to 1925, Kasanin and Kaufman⁵ reported that sixty-five under sixteen years of age were psychotics, of whom six were typically schizophrenic. Lurie et al⁷ studied 1,000 children, ages eight to sixteen years, at the Cincinnati Child Guidance Home. These children were sent to the Home not because they appeared insane but because of failure to adjust either in their home, school, or community. Nineteen of these 1,000 children

had a definite functional psychosis; thirteen of the nineteen were schizophrenic.

In 1,265 admissions of children under sixteen years of age to Maudsley Hospital, London, from 1935 to 1937, Creak⁴ diagnosed thirty-five as functional psychosis. The author felt that practically without exception such a psychosis in childhood is schizophrenia and therefore did not subdivide these thirty-five cases.

In 5,000 consecutive admissions to the Pennsylvania Hospital Strecker¹³ found eighteen functional psychotics under fifteen years of age. Of these, four were diagnosed schizophrenia, four doubtful, and ten manic-depressive psychosis.

In 32,443 hospital admissions in Munich from 1904 to 1922 Seelig¹² found 753 psychotics under fifteen years of age of whom forty-seven had been diagnosed schizophrenia. He questioned this incidence of schizophrenia and compiled the data in 23,935 admissions in Munich from 1922 to 1931 wherein he determined there were 480 psychotics under fifteen years of age of whom only four were schizophrenic. He also noted that during the same years of 27,377 admissions in Cologne 1,497 were psychotics under fifteen years of age but only three of these were schizophrenic.

During the ten year period from 1929 to 1939 there were 18,976 patients admitted to the three largest State Hospitals for the insane in Minnesota. Thirty-eight of these patients were under fifteen years of age and of this number eleven were diagnosed schizophrenia. The remainder had psychoses with mental deficiency, with epilepsy, with psychopathic personality, or with chronic encephalitis. Table I is a recapitulation of the incidence of childhood schizophrenia reported by various authors.

The prognosis in childhood schizophrenia is definitely unfavorable although not altogether hopeless. Kasanin and Kaufman⁵ reported three of their six childhood schizophrenic patients continued in the hospital. In Creak's⁴ series of thirty-five psychotic children, presumably all schizophrenic, twenty-six were traced, of whom fourteen improved and twelve remained ill. Potter⁹ studied six schizophrenics, four to twelve years of age, all of whom showed symptoms before the age of ten. No one of the six had any improvement after periods of hospitalization of three to eighteen months.

All of the eleven schizophrenic children ad-

SCHIZOPHRENIA IN CHILDHOOD—GRAY

TABLE I. INCIDENCE OF CHILDHOOD SCHIZOPHRENIA

Author	Years	Place	Total Psychotic	Psychotic Children	Schizophrenic Children
Kasanin	1923-25	Boston	6,000	65	6
Lurie		Cincinnati	1,000	19	13
Creak	1935-37	London	1,265	35	35
Strecker		Philadelphia	5,000	18	4
Seelig	1904-22	Munich	32,443	753	47
Seelig	1922-31	Munich	23,935	480	4
Seelig	1922-31	Cologne	27,377	1,497	3
Gray	1929-39	Minnesota	18,976	38	11

TABLE II. PROGNOSIS OF CHILDHOOD SCHIZOPHRENIA

Author	Schizophrenic	Traced	Recovered	Improved	Unimproved
Kasanin	6	6		3	3
Creak	35	26		14	12
Potter	6	6			6
Gray	11	11	1	5	5

mitted to the Minnesota State Hospitals from 1929 to 1939 were traced. Four of these patients remain hospitalized after periods ranging from three to seven years. Table II is a recapitulation of the prognosis of childhood schizophrenia reported by various authors. It indicates that recovery is very rare and that over 50 per cent of these patients remain unimproved.

Table III has further data concerning these eleven Minnesota State Hospital patients. In this series the ratio of childhood schizophrenia in boys and girls is about 1 to 2, which agrees with previous observations. The types of the psychosis were distributed as follows: hebephrenic seven, catatonic two, and paranoid two. The only patient who recovered was one with the hebephrenic type. Of the remaining six hebephrenic patients, three improved and two are unimproved. One of this group (Case 6) was unimproved at the time of her death from bulbar palsy and progressive muscular atrophy. This organic neurologic disorder, which is most unusual in childhood, appeared about one year after her commitment to the state hospital. It indicates a marked abiotrophy of the nervous system and suggests that schizophrenia and other functional psychoses perhaps in the final analysis may be structural in nature. Of the catatonic and paranoid patients one improved and one remains unimproved in each of these two types. One patient, a catatonic (Case 8), had two hospital

TABLE III. CHILDHOOD SCHIZOPHRENIC PATIENTS ADMITTED TO MINNESOTA STATE HOSPITALS.

Case No.	Sex — M F	Admission Age, years	Type	Hospitalization Years Months	Recovered	Improved	Unimproved
1	x	11	Hebephrenic	6	x		
2	x	14	"	3		x	
3	x	14	"	1 6		x	
4	x	14	"	3			x
5	x	13	"	6		x	
6	x	13	"	3			x
7	x	14	"	7			x
8	x	14	Catatonic	3		x	
9	x	14	"	3			x
10	x	14	Paranoid	2		x	
11	x	14	"	3			x
—	—				—	—	—
4 7					1	5	5

admissions, each of three months, with improvement in each instance. The other four patients who improved and the one who recovered were discharged from the hospital and have continued acceptably adjusted or well after periods ranging from two to seven years.

Schizophrenia in childhood is a rare and interesting mental disorder. Therefore the following report is presented concerning a patient affected with schizophrenia from nine years of age to his present age of twenty-four years.

Case Report

In September, 1930, M. M., a fourteen-year-old boy, was admitted to the University Hospital at the request of his paternal grandfather. His mother was residing in Colorado, and the whereabouts of his father was unknown. The history which the grandfather was able to furnish was very sketchy. The principal informant was the boarding mother, a trained nurse, with whom the patient had been living much of the preceding five years.

The father's age was forty years, the mother's thirty-two. Her health was good. The patient was an only child. His parents were divorced when he was about six years of age. Thereafter for two years he was in an orphanage, for one year with his mother, and then, in 1925, was placed in the informant's home.

The boarding mother said when the patient first came to live with her he would sneak about and appeared to be afraid. He was a peculiar and imaginative child. He would have frequent temper tantrums. He had piano lessons for three years and made very good progress. He was honest and trustworthy in all respects. He was always neat and polite. He was a member of a local Boy Scout troop, but never seemed to get into the spirit of the organization. He was

unduly sensitive and did not want to play with his schoolmates because they teased him for being timid.

After school hours he would stay in the house reading or writing poems, the subject matter of which frequently was in reference to religion or to a boy without a home. It was difficult to draw him into conversation, and one practically had to ask him a question in order to get him to say anything. In answering he would never talk directly to one but would turn away and look out of the window or he would stare into space for a while before replying.

A year previous to his hospital admission he spent one week with his father. He ran away from his father, returned to the informant's home, and said he had been mistreated. For three months previous to his hospital admission he had been living with his grandfather, who, according to the informant, was an overly religious individual.

The boy had completed the seventh grade in public school. His sixth grade teacher said he was peculiar in many ways and subject to a violent temper. Once when she reprimanded him he became very angry and shouted for a gun to shoot her. He was a superior student, especially in arithmetic and reading. In written work he was somewhat slow but very thorough. His seventh grade teacher said he did passing work in all his subjects, but was inclined to be a dreamer. He never seemed interested in playing with the other children unless he was in the right mood. He was slow in working with his hands. He excelled in writing original stories as he had an unusual imagination. The following poems, taken from his composition book, clearly show his trend of thought.

My Mother

I walk upon the rocky shore
Her strength is in the ocean's roar
I glance into the shaded pool
Her mind is there so calm and cool.
I hear sweet rippling of the sea
Naught but her laughter 'tis to me.
I gaze into the starry skies
And there I see her wondrous eyes.
I look into my inmost mind
And here her inspiration find.
In all I am and hear and see
My precious mother is with me.

Sweet Death

When at last your tired eyes close
No more to witness earthly woes
No more your struggle against cruel life
Which is only filled with tears and strife.

As far as could be learned the family and personal histories were negative. The boy said for six weeks he had been disturbed about his past evil acts and his present bad thoughts. He said he had heterosexual experiences when he was nine or ten years of age, his nerves were now hurting him, and he had funny ideas. He complained of weakness, headache, indistinct vision, heartburn, generalized gastric discomfort after eating, and tingling in his hands and feet. He said he had trouble in breathing, that he breathed too much with his stomach and not enough with his chest. He could not sleep well and was disturbed by distressing dreams.

The general physical and neurologic examinations and the routine laboratory tests all were negative.

His attitude and general behavior were variable.

Some days he was quiet and well mannered and helped with various chores around the wards. Often he had outbursts of unusual activity such as violently rocking forth and back in his chair or pacing excitably about the room pushing chairs from place to place. He would shout about God and the devil and talk disconnectedly frequently about snakes. At times he would strike the wall and beat himself. He would throw whatever might be at hand and mechanical restraints were sometimes necessary.

Other days he appeared depressed, cried considerably, and remained in bed. He said he did not want morning to come because it would be just another day. Sometimes he walked with a peculiar limp. He had spells wherein he seemed to have considerable difficulty in breathing.

He talked much about religion, the end of the world, and politics, and lectured to fellow patients on these subjects. Sometimes he went from patient to patient telling them they only imagined they were sick.

Most of the time he was uncommunicative, stared fixedly and without expression at some object, and appeared to be out of contact with his surroundings. There was commonly a long pause before he had any answer; whatever reply he made was disconnected and contained pronouns without antecedents. Sometimes he read in a loud voice from a book, usually starting at the back of the book. He said that no one understood him and everyone was talking about him. Then he would say he was disgusted with the Bible—"It's no good, I'd sooner play cards." He would mutter under his breath, repeat words and phrases several times, slam doors, and say he was going to kill himself by taking poison or jumping out of the window.

Some days he carried an apparently useless article, such as a roll of newspaper, around with him. He would snatch at space and say he saw little white things. He developed periods of silly laughter. He was suspicious of black-haired persons and said their purposes could not be defeated. He would put his bathrobe on backwards, did not understand how to put on his bedroom slippers, and stumbled awkwardly as he walked. He continually heard people say he was not a real boy. He often spoke of the sound of rain falling out of doors.

As time passed he became disoriented, his memory for remote and recent events poor, and his retention and recall lost. His grasp of general information became progressively more inaccurate. His insight and judgment failed.

He became very noisy, incontinent, and would not eat. He finally became so difficult to manage that he was transferred to the State Hospital in December, 1930.

The symptomatology in this case of autistic thinking, preoccupation, negativism with no basic mood disturbance, episodes of excitement, bizarre behavior, and mental regression warranted a diagnosis of schizophrenia, hebephrenic type.

The patient was unsuccessfully paroled from the State Hospital to his grandfather from May to August, 1931. In August, 1932, he was again paroled, this time

to his mother. He ran away from her home, was apprehended in Pennsylvania, and returned to the hospital in January, 1933. He eloped from the hospital in April, 1935, and was subsequently paroled to his mother in June, 1935. During a part of the next two years he was employed and rather interested in his work. However, disabling symptoms of the psychosis reappeared and in September, 1937, he was returned to the Hospital, where he has since remained.

His present mental status is as follows: At times he becomes very disturbed and peculiarly manneristic. He is careless about his personal appearance and generally is preoccupied. He appears apathetic, indifferent, and somewhat depressed. He does not initiate any conversation and answers only fragmentarily. He has aural and visual hallucinations and persecutory delusions. He is oriented for person and place but not for time. His remote memory is fairly good; recent memory is poor. His calculations are slow but accurate. His grasp of general information is moderately deficient. His insight and judgment are severely impaired.

Summary

The incidence of schizophrenia at whatever age obviously varies somewhat with the diagnostic criteria employed. Approximately one in 400 cases of schizophrenia manifests itself in childhood. The prognosis of childhood schizophrenia appears poor; recovery is an exception and improvement occurs only in about one-half the cases.

The fourteen-year-old boy here reported was diagnosed as schizophrenia, hebephrenic type. The symptoms of the psychosis were evident from the age of nine years. He remains unimproved at age of twenty-four. His pre-psychotic personality was that of an introvert. There is no known hereditary or constitutional factor involved in this case. The patient's conduct and writings indicate that environmental stress incident to the broken home was likely the precipitating factor in his psychosis.

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ERYTHROBLASTOSIS (ICTERUS GRAVIS) IN THE NEWBORN

Report of a Family of Three Children

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ALTHOUGH confusion prevails as to the existence of erythroblastosis fetalis as a definite clinical entity, severe icterus and edema of the newborn occur not uncommonly and require immediate treatment if life is to be preserved. We are calling attention to a family of three children: the first child died two hours after birth; the second child developed a typical picture of erythroblastosis and lived following treatment; the third child is perfectly normal, the mother having been treated during pregnancy with liver extract.

The highly familial tendency in this disease is well recognized. The possibility that many still-births or premature deaths are cases of

erythroblastosis, unrecognized, is a point which needs a great deal of emphasis. Javert³ and Macklin⁴ have both emphasized this fact. Bleeding or evidence of hemorrhage at necropsy following a difficult delivery may often be listed as the cause of death. This was the situation in the first case here reported. Only by the more careful and frequent examination of the viscera at necropsy in these babies will the true incidence and cause of death be revealed.

The prognosis of erythroblastosis heretofore has been very unfavorable. In the presence of universal edema of the newborn, death always results.⁶ When icterus is associated with edema, there have been a few recoveries. Three such

cases have been reported by Diamond, Blackfan and Baty in the literature.¹ Pehu⁵ believes the disease occurs more frequently than previously recorded and reports several families in which eight to nine pregnancies are recorded with but a single living child. He states that the disease can occur without the presence of numerous nucleated red cells being present in the peripheral blood, the only positive diagnostic evidence being found in the bone marrow and visceral organs. Pehu further states that in cases of previous evidence of erythroblastosis in the family, it is the duty of the physician to treat the mother during pregnancy with liver extract and transfuse the baby immediately following birth.

The early diagnosis of this condition is vitally important. The presence of an edematous placenta as well as a deep yellow amniotic fluid and vernix caseosa will greatly facilitate diagnosis. Jaundice usually appears in twelve to twenty-four hours following delivery. Pallor or anemia is an important feature but may be masked by the deep yellow color of the skin. The spleen and liver are enlarged. The blood picture usually shows a large number of erythroblasts and immature forms of both the red and white blood-cell series, the nucleated red cells averaging 20,000 to 100,000 per cubic millimeter. Anemia is striking and the hemolytic feature is outstanding, as manifested by increasing jaundice and anemia in spite of frequent transfusions. The van den Bergh is invariably indirect.

The differential diagnosis involves the following: congenital syphilis, sepsis of the newborn, congenital biliary obstruction, icterus neonatorum, acholuric jaundice and erythroblastosis fetalis,⁷ which includes icterus gravis, erythroblastosis, leukoblastosis and edema associated with icterus. Because of the bleeding tendency in some cases, hemorrhagic disease of the newborn should be included in the differential diagnosis.⁸

Pathologically the disease is one of diffuse erythropoiesis. The liver shows large numbers of hematopoietic areas scattered throughout the parenchyma. There is hyperplasia of the spleen, kidneys, heart, pancreas and bone marrow.

The following family is reported to emphasize the importance: (1) of the familial nature of this disease; (2) complete diagnosis in stillbirths and deaths attributed to difficult delivery; (3) the importance of early diagnosis and im-

mediate treatment by multiple transfusions; (4) the importance of the possibility of preventing the disease by treating the mother throughout pregnancy with parenteral liver extract. This suggestion was first made by Pehu,⁵ in the French literature. The third pregnancy reported here was treated throughout with parenteral liver extract. The baby is perfectly normal. This is offered merely as a suggestion worthy of further trial in families where the disease is known or even suspected to exist.

Case 1.—The mother is a twenty-one-year old primipara. The last menstrual period was July 5, 1936. She had no toxic symptoms during her pregnancy and had received regular prenatal care. Labor commenced May 1, 1936, and after five and a half hours a male infant was delivered, footling presentation. There was some difficulty in extracting the after-coming head.

The condition of the baby was poor and he died two hours after birth, all of the usual methods of treatment having been employed. The findings of significance at necropsy were as follows: Birth weight 9 lbs. 11 oz.—4400 grams, liver weight 130 grams (normal 70-88 grams). No gross edema was noted. There was a cephalhematoma in the left temporo-parietal region about the size of a hen's egg. There was hemorrhage over both cerebral hemispheres and blood at the base of the brain.

Diagnoses: (1) Cerebral hemorrhage; (2) Cephalhematoma.

Microscopic examination of the liver and spleen revealed a normal appearing tissue containing several blood islands, but appeared to the pathologists to be within normal limits for a newborn. The spleen showed hyperplasia. Bone marrow study was not done.

Clinically this patient might conceivably be classed as a case of erythroblastosis, the weight of the baby being in excess of the average newborn and over 2 pounds heavier than her subsequent children at birth. The liver weight of 130 grams was about two times the average weight of the liver of the newborn. The cephalhematoma and cerebral bleeding indicated an abnormal bleeding tendency, occasionally seen as a clinical feature of erythroblastosis.

Case 2.—The second pregnancy was normal throughout and resulted in a female child born following a normal delivery on August 4, 1937. The birth weight was 7 pounds 5.5 oz. (3300 grams). The baby appeared slightly pale and sallow at birth, but otherwise normal on examination.

About twelve hours following delivery, definite jaundice was noted and physical examination at that time revealed an enlarged spleen, palpable 3 cm. below the costal margin. The liver was not felt at that time.

The stools were dark brown in color and gave a positive test for bile. The urine was also dark in color with a positive test for bile pigments. The hemoglobin was 80 per cent or 13.6 grams (Sahli) (normal 110), white blood cell count 31,000, Kline test for syphilis negative.

The report of the hematologist on August 6 was as follows: "The blood smear shows the following morphological features: Anisocytosis of considerable degree, numerous macrocytes, polychromasia and many nucleated red blood cells. Most of these appear to be macro-normoblasts, and a few cells have many fea-

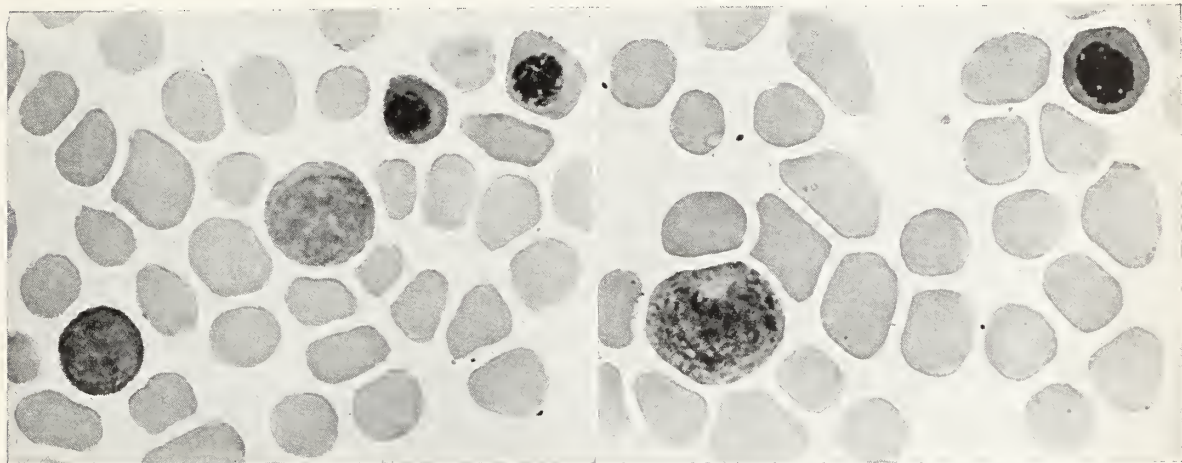


Fig. 1. Stained blood smears, Case 2, showing microcytosis and macrocytosis, immature red blood cells, normoblasts and macro-normoblasts, and immature white blood cells (oil immersion).

Blood smears taken on August 5 revealed a large number of immature red blood cell forms of the normoblast series, over 50 per cent of the nucleated cells being of this series. The differential white blood count revealed myelocytes 9 per cent; metamyelocytes 7 per cent; polymorphonuclears (I) 2 per cent; polymorphonuclears (II) 23 per cent; polymorphonuclears (III) 36 per cent; lymphocytes 22 per cent; monocytes 1 per cent.

Except for a temperature elevation to 100° F. (rectal) on the second day of life (August 5) the course was entirely afebrile.

On August 6 a transfusion of 80 c.c. of citrated blood from the father was given. The hemoglobin following this procedure was 89 per cent or 14.8 grams (Sahli). Cevitamic acid was started, 50 mg. daily being given orally throughout the hospital stay. Progress was favorable although evidence of hemolysis continued. The jaundice became intense and the spleen remained readily palpable, 3 cm. below the costal margin.

On August 9 the hemoglobin was 76 per cent or 12.8 grams (Sahli), and a second transfusion of 90 c.c. of citrated blood was given.

On August 12 the hemoglobin was 34 per cent or 5.6 grams (Sahli), and a third transfusion of 80 c.c. of citrated blood was given. Following this procedure, on August 13 the hemoglobin was recorded at 69 per cent or 11.6 grams (Sahli). The red blood cell count was 3,460,000.

On August 14, 1 c.c. of concentrated liver extract was given intramuscularly.

On August 15 the spleen was definitely smaller, being barely palpable, and the patient was sent home on iron medication only.

tures consistent with megaloblasts. There is a shift to the left in the myeloid line all the way to stem cells which may be found with relative ease. I do not believe this may be said to constitute a leukemia on the bases of the present findings, but rather a leukemoid reaction."

On September 3, 1937, four weeks after birth, the hemoglobin was 50 per cent or 8.4 grams (Sahli), reticulocytes 10.1 per cent. In spite of the evidence of active hematopoiesis, the hemoglobin was 52 per cent or 8.6 grams (Sahli) on October 2, 1937. One month later, on November 2, the hemoglobin had risen to 68 per cent or 11.6 grams (Sahli). The tip of the spleen could still be felt. On January 4, 1938, the hemoglobin was 92 per cent or 15.6 grams (Sahli). The spleen was no longer palpable. On March 1, 1939, the hemoglobin was 85 per cent or 14.4 grams (Sahli) and on May 9, 1938, it was 91 per cent or 15.4 grams.

One year following birth the physical examination was negative. The hemoglobin at this time was 82 per cent or 13.8 grams (Sahli). The child's development is normal, physically and mentally. At two years of age the patient is perfectly normal.

The above case seems to be rather typical of erythroblastosis fetalis, the striking features being pallor at birth, jaundice twelve hours later, increasing in severity for several days. The spleen was markedly palpable. The blood picture contained all of the characteristic features, large numbers of erythroblastic as well as leukoblastic cells.⁶ The response to multiple intra-

venous transfusions was very favorable. The importance of giving whole blood early cannot be overemphasized. Blood grouping and cross matching should always be done regardless of the patient's age or the use of parental donors.

Case 3.—The third pregnancy was normal throughout. The mother was given concentrated liver extract intramuscularly the last seven months of pregnancy at monthly intervals. X-ray examination of the mother was made in accordance with the technic outlined by Hellman and Irving,⁸ and failed to reveal any thickening or increased density of the soft parts of the fetus, indicative of edema. On September 14, 1939, a normal baby was born, weight 8 pounds 6 ounces. Examination revealed a normal newborn baby infant. The blood picture was as follows: hemoglobin 120 per cent, red blood cells 5,000,000, white blood cells 27,600, polymorphonuclears 64 per cent, lymphocytes 32 per cent, eosinophiles 4 per cent, bleeding time 3 minutes 30 seconds, clotting time 4 minutes. The smear showed no abnormality. At the age of six months this patient is quite normal.

Conclusions

1. The importance of complete and accurate diagnosis in all cases of still-births is again emphasized.

2. Treatment by multiple intravenous transfusions offers the greatest hope of cure in cases of erythroblastosis. Ascorbic acid and liver extract was also used in Case 2.

3. The possibility of preventing this disease by the administration of parenteral liver extract to the mother during pregnancy is merely suggested. The result of the third pregnancy in this family following liver therapy was normal.

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THE SULFAMIDO COMPOUNDS: THEIR PRACTICAL APPLICATIONS IN CLINICAL MEDICINE*

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THE present importance of sulfamido therapy as well as the rapidity with which this field has developed suggests the advisability of reviewing certain practical phases of this subject. It is true that our knowledge is still incomplete in many respects but it is also true that experience has taught us certain factors which serve to distinguish between adequate and inadequate therapy. I wish to discuss what I believe to constitute some of these factors.

Fundamentally, we have available only four sulfamido drugs of proved clinical value, namely neoprontosil, sulfanilamide, sulfapyridine and the sodium salt of sulfapyridine.

With this number of compounds to choose from it is necessary to use care in selecting the one most suited for the infection to be treated. There are several factors of importance which enter this decision. 1. Marked variability in ab-

sorption and acetylation of sulfapyridine. It is possible because of this factor to give a large amount of sulfapyridine without obtaining a satisfactory concentration of the free drug in the blood. On the other hand, with the use of sulfanilamide it is usual to obtain a concentration of that drug in the blood which is fairly closely related to the amount given. 2. Sulfapyridine appears to be a more toxic preparation than sulfanilamide. It produces all of the toxic effects of sulfanilamide and in addition shows an increased tendency to produce nausea and vomiting. It also may give rise to renal complications. 3. Neoprontosil while less toxic than sulfanilamide, is also proportionately less effective therapeutically. Neoprontosil thus lends itself for use particularly in instances in which sulfanilamide is not well tolerated and in which prolonged or intermittent treatment is indicated. It is also of value in circumstances in which it is not possible to keep the patient under close observation dur-

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ing treatment. 4. The individual drugs vary in their therapeutic effect on specific types of organisms.

Sulfanilamide to date, because of the foregoing reasons, is the drug of choice for infections produced by the beta hemolytic streptococcus. This is true of localized lesions and of more widespread infections such as septicemia and meningitis. In cases of hemolytic streptococcus septicemia, Herrell and I have found in a recent unpublished review that the mortality rate at The Mayo Clinic has dropped from 70 per cent to less than a half of that figure since the use of sulfanilamide was instituted. Sulfanilamide is probably also the drug of choice for infections produced by gonococci, although the controversy in regard to its merits and those of sulfapyridine for this condition is as yet unsettled. For infections involving the urinary tract, I should feel that, in general, sulfanilamide is also the drug of choice. Finally, infections produced by meningococci and by *Clostridium welchii* are members of the group of conditions preferably treated with sulfanilamide.

Sulfapyridine is definitely the best sulfamido drug for infections produced by pneumococci. The question as to the respective merits of sulfamido versus serum therapy for pneumonia is as yet unsettled and time will permit us only to touch briefly on this subject. It is necessary to bear in mind that the fundamental approaches of each of these methods of treatment are essentially different from one another. Serum acts by throwing an increased number of specific antibodies into circulation which neutralize capsular substance and thus permit phagocytosis and lysis of the organisms. Sulfapyridine reduces the multiplication of organisms and diminishes their invasive power and thus permits a normal number of antibodies to overcome weakened organisms which are diminished in numbers. It can be seen that for these reasons there is a basis for a synergistic action of serum and sulfapyridine such as has been described by Branham and Rosenthal and by MacLeod among others. Because of this the combined use of these two methods of treatment is justified for the severely ill patient when specific serum is available. In considering the problem it is necessary to take into consideration the cost of serum, plus the necessity for typing with its delays, as well as the availability of specific serum. Experience

has shown that the results of sulfapyridine therapy compare very favorably with the results of serum therapy. With all of this in mind it seems reasonable to start immediate treatment with sulfapyridine in cases of pneumonia and to carry out typing simultaneously. The sodium salt of sulfapyridine should be given intravenously, initially, for the acutely ill patient or may be given within a period of twenty-four hours if satisfactory improvement does not occur or if a satisfactory concentration of the drug in the blood is not obtained.

Sulfapyridine is the preferable drug for infections produced by the *Staphylococcus aureus*, Friedlander's bacillus and the *Streptococcus viridans*. Because of the effect of this drug on the beta hemolytic streptococcus it is also the drug of choice for infections of unknown etiology.

There is a second group of conditions aside from the foregoing in which the results from sulfamido therapy are not entirely satisfactory but appear to be of some benefit. Included in this category are such conditions as trachoma, lymphogranuloma inguinale, chancroid, undulant fever, and chronic ulcerative colitis.

Acute rheumatic fever, chronic infectious arthritis, subacute bacterial endocarditis, tularemia and the virus infections constitute a third class of conditions which definitely have failed to respond to sulfamido therapy.

The question of proper dosage is next in importance to that of selection of the most suitable drug, for failure to give a sufficient amount of the drug ranks equally with overdosage as a serious error of judgment. Good therapy requires the presence of an adequate concentration of the drug in the blood as soon after treatment is started as is possible. In using sulfanilamide for infections of moderate severity, concentrations of 5 to 8 mg. of the drug per 100 c.c. of blood are usually sufficient and ordinarily can be obtained in adults by giving 60 to 90 grains (4 to 6 gm.) of sulfanilamide daily. For mild infections and infections of the urinary tract concentrations of 3 to 5 mg. of the drug per 100 c.c. of blood will usually give satisfactory results and can be obtained in adults by giving 40 to 60 grains (2.7 to 4 gm.) of sulfanilamide daily. In the foregoing two groups of infections, there exists a frequent tendency to give more drug than is necessary. This, of course,

often results in symptoms of toxicity which disturb the patient and at times make it necessary to discontinue treatment before recovery has taken place. In using sulfapyridine for such infections as pneumonia, it is best to have a concentration of 4 to 6 mg. of the drug per 100 c.c. of blood. Usually an initial dose of 60 grains (4 gm.) and a daily maintenance dose of 90 grains (6 gm.) will result in such a concentration in adults.

The grave error of insufficient dosage usually is made in dealing with serious infections such as bacteremia and meningitis. For these conditions, there is a frequent tendency to give too little drug initially. The tendency is then to increase gradually the amount of the drug given as the situation grows more serious until in the terminal stages of the disease the patient as a last resort receives amounts of the drug approaching those which should have been given initially. Lockwood aptly expressed the effect of sulfamido therapy when he stated that the best results were obtained in the presence of maximal invasion of tissue and minimal destruction of tissue. He also produced experimental evidence to show that increased destruction of tissue causes increased formation of peptone which in turn seems to inhibit bacteriostasis. For these reasons, it is essential in cases of bacteremia and meningitis to obtain high concentrations of sulfamido drugs in the blood as soon as is possible in order to combat the infection before it can be well established in scattered regions and produce increased destruction of tissue. Experience has shown that treatment of this type will definitely lower pre-existing mortality rates. It has also shown that any tendency to lower these high concentrations of the drug before recovery is complete will definitely result in prolonged periods of morbidity. In using sulfanilamide for these conditions it is advisable to obtain a concentration of 12 to 16 mg. of the drug per 100 c.c. of blood. In using sulfapyridine for bacteremia associated with pneumonia, the concentration of the drug in the blood should be 10 to 12 mg. per 100 c.c. In cases of *Staphylococcus aureus* septicemia, the concentration of sulfapyridine in the blood should be 16 to 18 mg. per 100 c.c.

In using the sulfamido compounds it is essential that these high concentrations be established by the initial dose and that subsequent doses be

directed at maintaining the concentrations thus obtained. In using sulfanilamide, this type of result can usually be obtained by giving an initial dose of 50 to 80 grains (3.3 to 5.3 gm.) of the drug to adults, depending on the patients' weight.

In order to obtain the desired high concentration of sulfapyridine in the blood, it is frequently necessary to supplement oral administration with the intravenous use of the sodium salt of sulfapyridine. As a rule, we have given 0.06 gm. of the sodium salt of sulfapyridine per kilogram of body weight as originally suggested by Marshall and Long. At times we have given amounts greater than this but in no instance have we given more than 5 gm. of the sodium salt of sulfapyridine in a single dose. We have dissolved this material to make up a 5 per cent solution in distilled water. As this solution is highly alkaline it must be given directly into the vein and must be given slowly. The dosage suggested will usually serve to increase the concentration of the drug in the blood by 5 to 8 mg. per 100 c.c., and the dose may be repeated in six hours if desired. It is to be emphasized that this form of intravenous medication is to be used essentially as an adjunct to oral therapy and in instances in which oral therapy will not produce the desired concentration of the drug in the blood or where it is desired rapidly to produce this desired concentration. We have used it only in rare instances as the sole measure of treatment. It is well to remember that if the patient is unable to swallow, sulfapyridine may be given as a suspension in milk or water through a Rehfuß tube. The sodium salt of sulfapyridine in a 5 per cent solution should never be given intramuscularly or subcutaneously and sulfapyridine should never be given intravenously.

In conjunction with treatment I would like to emphasize that it is possible to commit a serious error in the treatment of some conditions by discontinuing the use of the drug too soon. Recurrences of disease are particularly likely to occur if infections are produced by staphylococci or pneumococci, or in cases in which the lesion involves the ear, bone, meninges or blood stream. In the presence of infections of this type, it is well to continue with some administration of drug for six to ten days after recovery has apparently taken place.

CASE REPORT

The toxic effects which result from the use of these compounds are too generally well known to bear a systematic review at this time. There are, however, certain points connected with these toxic effects which are of sufficient importance to be briefly emphasized. Among these are such facts as: 1. Cyanosis is probably the most prevalent and impressive of toxic symptoms but is of least importance as an indicator of danger. 2. Acute hemolytic anemia tends to occur in the first week of treatment and a mild progressive anemia may occur later. 3. Leukopenia and agranulocytopenia tend to occur after the first week of treatment. 4. Cutaneous eruptions and fever tend to occur particularly in the seven to eleven days of treatment. 5. Persistent mild symptoms of toxicity may offer a warning of more serious impending complications and should be carefully heeded. 6. When high con-

centrations of drug are present in the blood it is necessary to observe carefully for possible renal complications or cerebral manifestations of toxicity.

It has been our experience to learn that increasing observance of the foregoing principles has resulted in a definite improvement in the results which we have obtained with infections treated with sulfamido compounds.

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CASE REPORT

THREE VARIANTS OF SOLITARY RENAL CYSTS*

ARNOLD SCHWYZER, M.D.

Saint Paul, Minnesota

THREE cases of solitary renal cysts are herewith reported which illustrate variations in their site and relation to the kidney and pelvis and also as to their pathogenesis.

Case 1.—Mrs. T. St., a woman fifty-five years old, had had seven children, but no serious previous illnesses. For about a year she had often suffered from nausea and intestinal pain. Some months before coming to us she had had repeated vomiting but never any severe attacks of pain. She had lost some weight. She was referred to us on account of a large mass in the left hypochondrium, which was sensitive and extended from the kidney lodge to below the navel and almost to the midline. Bilateral retrograde pyelograms were made. The right side appeared normal. The left kidney shadow was found markedly enlarged, the inferior pole extending down almost to the iliac crest. Evidence of considerable pressure on the inferior portion of the left renal pelvis was noticed and also on the inferior calix which was markedly dilated and had lost the terminal markings. The left ureter was displaced mesially. The appearance indicated a large mass in this region which could be either a large tumor or a cyst. The absence of invasion of the inferior calix made the roentgenologist decide, though not definitely, in favor of a cyst.

At operation a cyst as shown in the sketch (Fig. 1) was found. It was the size of a very large grapefruit (11 cm. in diameter). After freeing the cyst, a sling, made of gauze, was placed around it and with this help

the mass which was almost too large for the wound could be brought to the surface. The upper pole of the kidney was left undisturbed. The lower pole of the kidney from which this cyst originated, was then resected and sutured step by step. The report of the operation reads that less than a teaspoonful of blood was lost in resecting the kidney. Recovery was uneventful. There is nothing particularly noteworthy about this case except that the cyst is the largest of this kind I happen to have seen.

Case 2.—Mrs. St. Gl., on February 16, 1937, came to our office where the following notes were made: Age thirty-five, had three children living and well. Had thyroidectomy in 1926 and tonsillectomy six weeks later.

For four days pain had been frequent in the right iliac fossa. Eating caused cramps and no appetite was present. Bowels have been regular.

Examination of the decidedly nervous person yielded no evidence of disease of the head, neck or chest. The upper abdomen was normal, the cecum bulky and was the seat of the pain. The right kidney was very loose; it could readily be brought far over to the midline and downward to rest with its midportion over the innominate line. The pain was, however, not located in the kidney. A bulky hump could be felt on the kidney and two sketches were made which showed that we were uncertain whether the rounded prominence rose from the midportion (Fig. 2) or the upper pole. The x-ray showed a distorted middle calix and no filling of the lower one. The urine was normal. After a transfusion on account of marked anemia, we first removed the long and thickened appendix through a small grid-iron incision. Before closing the wound we had the

*Demonstrated before the Saint Paul Surgical Society, March 7, 1940.

patient draw a deep breath which brought the kidney down where we could hold it over the innominate line. We then saw on the kidney a bluish round bulging, the size of a tangerine, distinctly a cyst. A lumbar incision of 4 or 5 inches, half of which was over the lumbar muscles, was made and through the anterior half

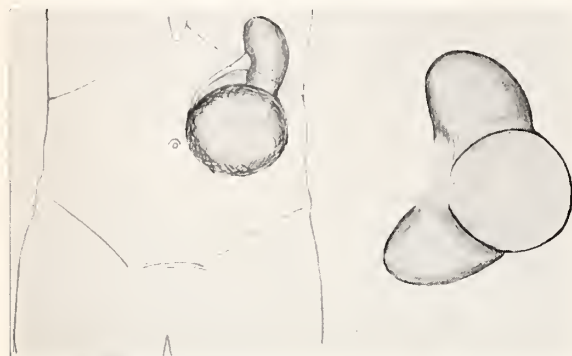


Fig. 1 (left) Case 1. Large cyst of lower pole.
Fig. 2. (right) Case 2. Cyst over posterior aspect of midportion of kidney.

of it the flat abdominal muscles were simply split. We did not feel we needed much of an opening. However the costo-vertebral ligament was cut. Through this restricted incision the kidney could not be brought out of the wound but with the help of a rubber tube looped around it, was brought sufficiently into the wound to excise the cyst which proved to be sitting on the midportion of the posterior surface. Considerable urine escaped from the pelvis of the kidney. However, the cyst was not opened. It was cut away with a very thin layer of kidney parenchyma. A continuous catgut suture controlled the bleeding. The hemostasis was assisted by Sistosan. The ptosis was counteracted by the insertion of four rubber drains. It is now nearly three years and there are no complaints referable to the kidney though the patient is of a highly neurotic type. The cyst, which you see here, has a diameter of about six centimeters.

The patient had herself felt the floating kidney and had been worrying about it. What symptoms there may have been, were due rather to the pulling on the renal pedicle than to the harmless looking cyst.

Case 3.—A para-and intercalicular cyst of kidney. The patient, Dr. A. W., a woman of sixty-five years, had spent twenty-three years as a missionary physician in upper India. She had been of robust physique but went through most strenuous years being the only scientifically trained doctor in an area 150 miles long and 50 miles wide, doing all kinds of medical and surgical work, neglected appendices, gallbladders, goiters, hysterectomies, cesarean sections, bone operations and what not, with several hundred cataract operations thrown in for good measure. In the course of years she had undergone an appendectomy, hysteromyomectomy, but always afterwards resumed her work. However, about five years ago she was forced to give up when she was taken with a severe hemorrhage at the base of the brain. In 1938 a profuse hemorrhage from a duodenal ulcer occurred and in addition to all this she was suffering from a moderate diabetes and high blood pressure (210/102).

She came to me primarily on account of a severe and constant pain in her right hand where the index finger had been removed on account of a septic infection thirteen years before. Excision November 15, 1939, of a neuroma of a branch of the median nerve and resection of a tendon to which the neuroma was fixed gave such prompt relief that she had the courage a few days later to tell me of a constant great pain in the left kidney region. Palpation of the kidney area

was very painful. The kidney itself appeared somewhat enlarged. The sugar in the urine had cleared up after a few days of strict diet. Blood urea 42 and 24 mg. on two occasions. Phenol-sulphone-phthalein test yielded for the first hour 30 per cent and for the second 15 per cent.

X-ray study before and after the intravenous injection of Diotrast showed an enlargement of the upper pole of the left kidney (Fig. 3). A rounded pressure defect on the upper part of the pelvis was seen which also caused an elongation of the lower calices. In addition the roentgenologist (Dr. Medelman) saw evidence of marked pressure on the upper calices. The right side appeared normal.

On November 20 we exposed the left kidney under spinal anesthesia. A most severe perinephritis was encountered, the kidney being firmly adherent to the hardened cicatricial fat. Caution forced us to deliver the kidney only partially into the wound on account of the cicatricial fixation of the pedicle. The sketch demonstrates the appearance of a cyst resting broadly against the posterior aspect of the renal pelvis. It was very thin walled, bluish, and if it had not been for the great thinness and transparency of its wall, could have been taken for a distended pelvis on account of its relation to the kidney. It then ruptured and was widely opened, which allowed us to recognize its peculiar relation with the pelvis, the bulk of which ran freely through the center of the cystic cavity and was considerably elongated. The calix leading to the upper pole was greatly drawn out. It ran freely through the lumen of the cyst cavity and could be hooked over the finger. It was hardly bigger in its midportion than a parlor match, (2.5 to 3 mm.). The portion lying free in the cavity was 3 to 3.5 cm. in length. It was seen emerging from the main portion of the pelvis which was also for the greatest part of its circumference in the cavity of the cyst.

We had the impression that a thin-walled cyst had developed in or very near the space between the upper main calix and the main portion of the pelvis, perhaps near the surface of the columna Bertini, corresponding to this interspace. The cyst would then have separated the parts, grown in where the resistance was least, encircled the upper calix completely and almost completely the remainder of the pelvis. The cyst walls where they touched each other after surrounding the upper calix, must have disappeared, an occurrence one sees quite commonly for instance in multilocular ovarian cysts where parietal remnants of such septa tell the tale.

It did not appear proper to stretch the parts too much for further investigation for fear of incurring damage. The free parts of the cyst wall were resected and the remainder swabbed with absolute alcohol. Collapsible rubber drains were put in place and the wound closed, after a pea-sized cyst on the surface of the cortex had been punctured. The patient left the hospital on the eighteenth day. The wound then slowly closed. In a letter dated January 15th, the patient reports that the old pain was gone. How much of the distress had been due to the cyst and how much to the severe perinephritis remains questionable. A later report announced again much pain in that area.

The microscopic examination of the cyst wall showed only thin strands of connective tissue. No lining, neither epithelium nor endothelium, was seen.

To sum up:

The first case was a solitary cyst of the type most frequently seen but unusually large.

The second one was located in the midportion of the kidney and had an intimate connection with the renal pelvis.

The third case appears to be quite unusual on ac-

CASE REPORT

count of its extending in between the calices and also by the absence of any epithelium which otherwise lines these cysts. A parasitic cyst, like an echinococcus, could definitely be excluded, though exposure to tropi-

These three cysts were distinctly outside the renal parenchyma and appeared to have had no connection with it. In the second case there was, however, an intimate connection with the renal pelvis. Though

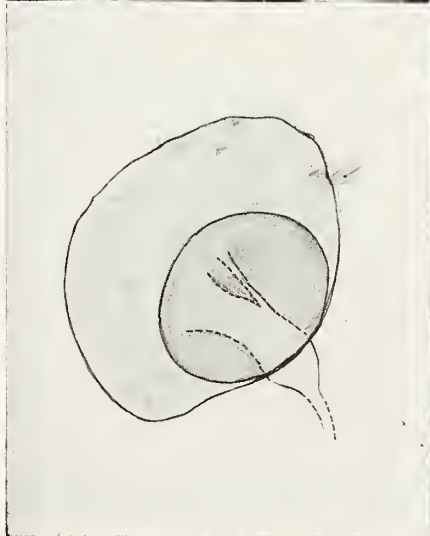
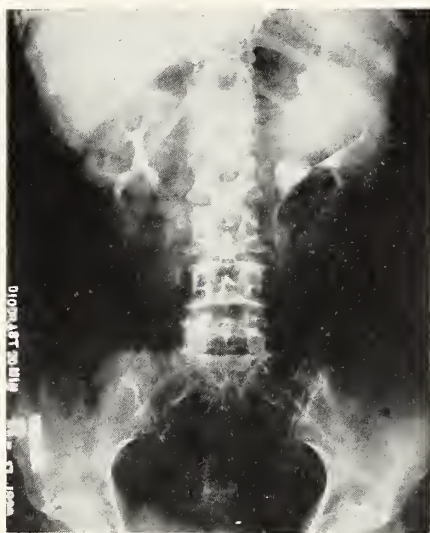


Fig. 3 (upper left) Case 3. Retrograde pyelogram. Evidence of pressure on the left renal pelvis. Note drawn out lower calices and absence of connection between lower part of pelvis and the peripapillary distal portion of upper calices.

Fig. 4 (upper right) Case 3. Outline of kidney and vertebrae traced through the x-ray film. Size and position of cyst shown by dotted line.

Fig. 5 (lower left) Case 3. Appearance of renal pelvis after opening the cyst. Note severe perinephritis, drawn out thin upper calix running entirely free through the cystic cavity. The main portion of the pelvis was almost completely free in the cyst cavity.

Fig. 6 (lower right) Case 3. Retrograde pyelogram taken twelve days after operation.

cal filth and poverty leads the thoughts in such a direction. There remains the possibility of lymphatic origin or of some infective process leading in the late end to a local hydropic condition. This latter view would be supported by the very outspoken perinephritis. However, the distinct cyst wall, though paper-thin with loose connective tissue on it, speaks against it. Perhaps we have to fall back on the alibi of some congenital malformation.

the dissection of the cyst was done most carefully and without breaking it, the renal pelvis was opened. The opening itself was not seen, but much urine escaped from the renal pelvis into the wound.

All three patients were women, thirty-five, fifty-five, and sixty-five years of age. This corresponds with the general experience that most of such cysts are found in grown people, often in later years and more frequently in women.

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN WINONA COUNTY

(Continued from July issue)

Biographies

Samuel D. Miller was born in Union County, Indiana, about 1824. He served during the Mexican War, and came to Winona County in the fall of 1869. First he settled at Homer. He moved to Centerville in 1874, and four years later moved to Witoka. He was a member of the Legislature during the sessions of 1878-1879. He engaged in the drug business during his stay at Witoka. In 1882, he moved to the city of Winona, and died there from a dose of morphine in the year 1883. He was a member of the Masonic Order and of the Temple of Honor.

C. C. Moore, M.D., homeopathist and surgeon, came to Winona in 1856, giving many references on his card, three judges in Iowa, Wisconsin, and New York, a Wisconsin bank president, and Rev. H. S. Hamilton of Winona. The year following his establishment in Winona, he engaged in the jewelry business and continued in it for several years. During this time he probably continued to practice medicine.

William S. Morrison came to Winona County in the 1860's. In 1868 he moved from Lewiston to Fremont. There he continued to practice his profession for many years. In 1884 he opened an office at Lewiston, probably retaining his Fremont practice at the same time.

Edwin S. Muir came to Winona in 1898 from Plainview where he had practiced for four years following his graduation from the University of Minnesota in 1894. He was associated with Dr. W. T. English when he first came to Winona and succeeded Dr. English when the latter died. Dr. Muir was highly esteemed both by his professional confreres and the people of Winona. He served as Mayor of Winona for two terms. Dr. Muir remained in Winona until the time of his death July 14, 1919.

L. H. Munger graduated from the Missouri Medical College in 1879. He came to Saint Charles to practice in 1881. He may have moved to Stearns County for a time, but later he returned and became a member of the Winona County Medical Society.

William Netter, a doctor from Rochester, moved to Winona about April of the year 1882. William Netter was engaged in the drug business in Winona with Dr. Wedel during the sixties.

William J. Newberry, M.R.C.S., a practicing physician at Minnesota City, came in 1882 from London, England, and bought the residence and office of Dr. Walrath. Dr. Newberry was a licentiate of the Society of Apothecaries,

London. After coming to Winona County, he became a member of the Winona County Medical Society.

John C. Norton, A.M., M.D., settled at Homer in 1855. In that year he ran for the office of assessor. In January, 1857, the following card was published in the Winona paper:

J. C. NORTON, A.M., M.D.
Physician and Surgeon
Justice of the Peace
Land Surveyor, & Coroner
Homer, M.T.

Dr. Norton wrote a series of articles on the botany of Winona County which were published in the Winona paper in 1858. He was also a very popular lecturer.

Jean O'Hara, a homeopathic physician and surgeon, came to Winona about 1873. He was a druggist and physician between 1878-1885. Dr. O'Hara was a man of unruly disposition, and got into several small disputes during his stay in Winona. In 1884, he shot a barkeeper in the leg while drunk. At another time he had a man arrested and fined for shoving him off the sidewalk.

Dr. Palmer owned a farm in Winona County about 1882.

W. Thorton Parker graduated from the Royal University of Munich. He was surgeon of the White Earth Reservation before coming to Winona, and had been for a time a resident of Boston, Massachusetts. He located in Winona in May, 1881.

J. S. Pashley, M.D., physician and surgeon, settled in Winona with a view to permanent residence in July, 1865, and solicited a share of public patronage by his card in the newspaper.

D. C. Patterson, M.D., came to Winona in May, 1856, at which time the following card was published:

D. C. PATTERSON, M.D.
Late of Cleveland, Ohio
Will give his attention exclusively to the practice of
Medicine & Surgery

In 1859 Dr. Patterson took Dr. C. B. Dayton as a partner. Three years later, Dr. Patterson had left Winona, probably going directly to Washington, D. C., where he resided in 1879 and later.

E. H. Patterson was a Winona physician about 1860. Possibly confused with Dr. D. C. Patterson.

Dr. Peake practiced in Winona County about 1863.

J. L. Peregrine practiced in Winona about 1883.

Thomas A. Pierce, M.D., came to Winona from Galena in November 1863. At that time he published the following card:

THOMAS A. PIERCE, M.D.
Homeopathic Physician and Surgeon
Office over Wickersham's drug store
Second Street
References: W. W. Huntington, P. M.; E. A. Small, J. A. Packard, Galena, Ill.; A. E. Small, M.D., D. S. Smith, M.D., Chicago.

Dr. Pierce graduated in 1850 from the Homeopathic Medical College of Pennsylvania. Not long after coming to Winona to practice he took Dr. William A. Whippy as a partner. Dr. Pierce was much interested in politics and in educational matters. He served on the Board of Education in 1874 and in 1879. He was a director of the Board in 1880 and again in 1882. Dr. Pierce was known as the leading homeopathic practitioner of Winona for many years.

Charles H. Prague (or Pague), **M.D.**, was a graduate of the Bellevue Hospital Medical College of New York City, and a member of the Oneida Medical Society there. He came to Winona to practice in September, 1866, and remained there for a decade or more.

J. E. Putnam was listed as a Winona County physician in 1865.

August Putsch graduated from the Homeopathic Medical College of Missouri in 1869. In 1872 he practiced as a physician and surgeon in Winona. During 1872-1873 and possibly later, he had a jewelry store in Saint Charles. He still practiced in Winona in 1885.

Dr. Reddington was listed as a Winona County physician in 1864.

L. Redmon opened an office and started practice in Winona in May, 1882. Dr. Redmon was an early settler of Preston and was well liked there, both personally and as a physician.

Dr. Reinholz was a physician at Lewiston in 1883.

A. D. Reynolds was a Winona County physician about 1863.

Edson Rhodes, M.D., graduated from the Rush Medical College in 1883. He came to Winona the following year and became the partner of Dr. D. H. Stewart. Before his arrival, Dr. Rhodes had held the position of resident physician of the Cook County Infirmary, Chicago. He became a member of the Minnesota State Medical Society in 1885, and was also a member of the Winona County Medical Society.

William H. H. Richardson, M.D., came to the United States in 1854. In 1856 he took out citizenship papers in Fillmore County, Vermont. He practiced for many years at Montpelier, Vermont, until his coming to Winona in the spring of 1867. Upon arriving, he formed a partnership in the practice of medicine and surgery with Dr. Franklin Staples. Dr. Richardson is recorded as a graduate from the Bellevue College, New York. He was a charter member of the Winona County Medical Society, and became a member of the State Medical Society in 1870. Dr. Richardson died of apoplexy on June 10, 1874, in Winona. He was known as a thoroughly educated and skilled physician.

S. D. Richardson was a physician in Winona County about 1863-1865.

W. H. Robbins was a practicing physician at Saint Charles about 1879. He was medical examiner for the Royal Arcanum Council of Saint Charles and a charter member.

T. W. Roberts graduated from the Homeopathic Medical College of Chicago in 1884. He had practiced in Winona County for many years previous to that date, having come as early as 1866.

Carl H. Roemer came to Winona to practice in 1876, or before. He departed in 1877 on the pretext of seeing a patient in La Crosse. He had married a widow with tempting property a few months previously, and made his disappearance after drawing \$4,000 from the banks. He returned later, but after another attempt to abscond in 1878, was caught and brought back by the sheriff.

F. H. Rollins, M.D., practiced in Winona County about 1880. In 1930 he was still practicing at Saint Charles.

Augusta L. Rosenthal, M.D., located in Winona for the practice of medicine and surgery in July, 1884. In her card she offered special attention to diseases of women. In 1885 she was proposed for membership in the Winona County Medical Society, but was not accepted because of her sex. However, she became a member of the Minnesota State Medical Society later the same year.

R. N. Sackett, physician and surgeon, practiced in Winona County about 1869-1870.

J. W. Scott graduated from the medical department of the University of Wooster in 1880. In February, 1882, he came to Saint Charles from Ohio, and started practice. He became a member of the Winona County Medical Society in the year of his arrival. In 1885, he served on the local Board of Health, and the same year he attended the conference of state and local boards of health and sanitary councils for southeastern Minnesota.

J. B. Seaman was a Winona County physician who came before the close of 1856. He practiced medicine to some extent but later advertised himself as a "surgeon-dentist."

Samuel B. Sheardown was born in Catlin, Chemung County, New York, on October 7, 1826. He commenced his practice in the office of Dr. Winton of Watkins, New York. He married Dr. Winton's daughter, Mary, and brought her to Winona in 1856. His card, published in January of that year, read as follows:

DR. S. B. SHEARDOWN
Physician and Surgeon

Having had long and extensive experience in both the above professions, offers his services to the citizens of Winona and the public at large. He will be found at any time, when not engaged, during the day and night, at his office in the Drug Store, opposite the Post Office.

In May of the same year, Drs. Sheardown and Cole formed a partnership. During the Civil War, Dr. Sheardown served as surgeon of the 10th regiment and was stationed for some weeks in hospital service at St. Louis, Missouri. He practiced in Winona, then at Stockton for several years before his departure, and was again at Stockton after the war. There he opened a drug store, and at the same time continued his medical practice. He was very much interested in the development of the village and in its

religious and educational growth. He owned a half interest in a very productive flour mill and also part interest in a creamery.

At the same time the political affairs of the country claimed his interest. He was an active Republican and was elected to the lower House of the Legislature in 1862 and to the Senate in 1869, and again to the House in 1881.

He went to the aid of the New Ulm people during the Indian outbreak in 1862-1863, and was present at the hanging of the thirty-eight Indians at Mankato, and acted as one of the examining surgeons, pronouncing life extinct.

Dr. Sheardown was one of the charter members of the Winona County Medical Society organized in 1869, and was its first president. He served again in that capacity in 1870, in 1877, and in 1889. He was also a member of the State Medical Society and held the office of treasurer from 1869 until the time of his death. In 1875-1876 he taught in the Winona Preparatory Medical School.

At several times Dr. Sheardown had an office in Winona and made the first attempt at establishing a hospital there. His practice at Stockton was large, however, and required most of his attention. In the year 1882, Dr. Sheardown was postmaster at Stockton.

In the year 1884 Dr. Sheardown and his son, Dr. T. W. Sheardown, opened an office in Winona and both remained there for a time. Dr. Samuel Sheardown died August 1, 1889.

Thomas W. Sheardown, M.D., was the son of Dr. S. B. Sheardown. He was born in 1856, the year of his father's arrival in Winona. In March, 1879, he graduated from the Jefferson Medical College in Philadelphia, after a two years' course, with high standing in his class. First he took up his practice at Lake Benton. In the year he started practice he became a member of the Minnesota State Medical Society. The following year, there was a note published in the Winona newspaper to the effect that Drs. Andrews and Groesbeck of Lake Benton complimented Dr. Thomas Sheardown on a successful amputation.

In 1881, Dr. Sheardown practiced in Stillwater, but in December of that year he moved to Minneapolis, where he opened a drug store. In November, 1883, he moved to Knoxville, Tennessee, to practice. It was the following year that he and his father opened an office in Winona. Some time later, he went to Chicago, where he did not practice medicine but was employed by the McIntosh Battery and Optical Company as manager of the stereopticon department. He remained with this company until his death in 1896.

Charles S. Sheldon came to Winona to practice in September, 1868. His card stated that he was a late resident physician of the Buffalo General Hospital. He had graduated from the New York College of Physicians and Surgeons in 1868. Dr. Sheldon was a charter member of the Winona County Medical Society and became a member of the Minnesota State Medical Society in 1871. While in Winona he was assistant superintendent of the Congregational Sunday School, and upon his departure from the city in December, 1871, he was presented with a watch chain and cross by that organization. He moved to Greenville, Michigan, after leaving Winona.

George Sieler was a practicing physician at Alma during the eighties or before. He became a member of the Winona County Medical Society.

Thomas M. Sime, physician and surgeon, came to Winona to practice in 1866. He was an oculist and aurist. During his stay in Winona he was involved in two court cases. In February, 1873, he brought suit against E. L. Frary to recover \$40 for medical services in treating a sore eye. The case resulted in his being allowed \$10 by the court. In 1874 a case was brought against him and he introduced Drs. D. A. Stewart and J. B. McGaughey, both men of high reputation, for the defense. In November of that year he sold out his interests in Winona and moved to Menomonie, Wisconsin.

A. O. Slade was a druggist and physician in Winona. He came about 1879 and lived there during the eighties. He was "Surgeon-at-Arms" for the Winona Archery Club.

Columbus G. Slagle was a physician and surgeon of Saint Charles. He was a charter member of the Winona County Medical Society, organized in 1869. During that year and the next he was the partner of Dr. Sudduth. After leaving Saint Charles he practiced in Minneapolis for many years.

M. K. Smart was listed as a Winona County physician about 1864.

J. G. Smith came to Winona and started practice in May, 1879. He had been the house surgeon and physician at Bellevue and Blackwell's Island Hospitals, New York City.

(To be continued in the September issue)

President's Letter

WITH all Europe a battleground, Japan trying to conquer China and threatening to involve most of Asia, and Italy fighting the British in North Africa, it is time the United States started better defense measures and embarked on a program for enlarging her army and navy. During the World War about 63,000 physicians volunteered and served as medical officers. At the June meeting of the American Medical Association in New York a resolution was passed by the House of Delegates offering the full services of the American Medical Association and of the physicians of our country as needed. Dr. George C. Dunham of the United States Army presented a plan for the procurement of professional personnel for the Medical Corp of the Army in the event of a national emergency. This will be worked out through the office of the American Medical Association.

Our State Medical Association has had a Committee on Military Affairs for many years and the procurement plan in our state will be worked out with the aid of this committee working in conjunction with the Council of our State Medical Association. A questionnaire has been sent to every physician inquiring whether he wishes to enlist for active service or home service, age, family obligations, and special qualifications, training, and experience. Each physician is expected to fill out the questionnaire and return it so a complete list of the physicians and their qualifications and answers will be on file in Chicago. Should there be a call of physicians the quota for each state will be determined and our State Committee on Military Affairs will designate the men needed to fill the quota in the State.

Selections will be based on many considerations with special attention to the responsibilities of the individual to family and community. When the questionnaire arrives, each physician is requested to fill it out and return as promptly as possible. While we all realize that a war would be a calamity and earnestly hope it will be averted, should it come, we as a body of physicians have a patriotic duty to fulfill. The same loyalty and self-sacrificing devotion which the physicians have shown in every emergency in our country's history is expected, and will, undoubtedly be shown again should the necessity arise.

B. S. ADAMS, President
Minnesota State Medical Association

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

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MALARIA THREAT IN MINNESOTA

THE report of a survey by Daggy and others
which appears in this issue of *MINNESOTA
MEDICINE* shows a marked predominance of the
anopheles mosquitoes in the valley of the Mis-
sissippi River in Minnesota. In view of the lim-
ited number of anopheles found in previous more
limited surveys in Minnesota, it seems this consti-
tutes a change in the species of mosquitoes in this
territory.

Malaria has never been a serious problem, or
any problem at all, in Minnesota. Two or three
indigenous cases have been reported each year
until 1939, when the number suddenly jumped
to seventeen definite indigenous cases, and pos-
sibly four more of the total twenty-three cases

reported in the state. Wisconsin has had a simi-
lar experience.

The situation has caused some concern in pub-
lic health quarters. Attempts have been made to
explain the apparent influx of malaria-carrying
mosquitoes. The question has been raised wheth-
er damming of the Mississippi has provided more
quiet and clean waters which this particular spe-
cies prefers.

With an apparent abundance of malaria-
spreading mosquitoes in the state all that is need-
ed is a few accessible malaria patients for the
disease to spread.

The influx into Minnesota of thousands of sol-
diers from the South for military maneuvers,
which has already begun, will doubtless provide
cases of smouldering malaria for the anopheles
to work on. The anopheles exist in the regions
where some forty or fifty thousand recruits will
be encamped. It is safe to assume that the mos-
quitoes will have considerable access to the re-
cruits.

The report calls attention to the increase in
malaria in Minnesota last year and suggests the
likelihood of a further increase this year. The
profession should be malaria minded.

RUDOLPH MATAS: NESTOR OF AMERICAN SURGERY

IN LEGENDARY lore Nestor, King of Phyllos
in Ancient Greece, was the oldest and most
experienced warrior who took part in the siege
of Troy. His name has therefore come to be
used as a title of honor and respect for those of
advanced years who have reached leadership in
any field of human endeavor. Very fittingly can
it be applied to the case of Rudolph Matas, whose
eightieth birthday occurs on September 12, 1940.
His career as a surgeon, coupled with his work
as a teacher and writer, entitles him to the highest
degree of recognition and an enduring place in
the topmost ranks of his fellows.

Matas received his medical degree in 1880 at
the age of twenty, after the customary short
novitiate of that period when medical knowledge
was scanty. Supplementary training like fellow-
ships was unknown and even internships were

rare and primitive, never obligatory. But Matas was quick to grasp opportunity and soon secured a demonstratorship of anatomy which he held for ten years and today regards it among the most profitable and happy experiences of his life. At thirty-four he became professor of surgery at Tulane and thereafter his record is one of steady progress and accomplishment.

While best known for his original and extensive work in blood vessel surgery, which revolutionized all the old ideas, Matas was a pioneer in many other fields of general surgery and made enduring contributions. His bibliography includes over four hundred titles covering practically the whole field of surgery. He devised many original procedures, especially for the relief of postoperative complications, which have later been rediscovered and publicized by others. For further details of these and other similar matters attention is invited to the current issue of the *Bulletin of the American College of Surgeons* which contains the addresses delivered at the testimonial dinner tendered to Dr. Matas in New Orleans earlier in the year, on the occasion of his completion of sixty years' practice.

To study the record of a life of achievement like that of Rudolph Matas is a refreshing interlude at a time like this when the world is filled with the echoes of the forces of destruction and the finer things of life are in the shadows.

—GILBERT COTTAM, M.D.

QUARTERLY JOURNAL OF STUDIES ON ALCOHOL

THE appearance in June of the first number of the *Quarterly Journal of Studies in Alcohol* questions why such a journal was not published in this country before. With the discontinuance of the *British Journal of Inebriety*, this new journal is the only one devoted to problems of alcohol published in English.

There is need for such a journal. The subject of alcohol is an important one and a journal devoted to it makes available authoritative and unbiased information on the subject. Information put out by the liquor interests or by the temperance league is questionable because of its source.

That this new journal will be scientific and reliable is assured by the personnel of the editorial board and the editor, Howard W. Haggard. The Research Council on Problems of Alcohol re-

cently formed by the American Association for the Advancement of Science has chosen the journal as its official organ.

If the quality of the articles which appear in the first number of the journal is maintained in future issues the new publication will make a contribution to the problem of alcohol. Our best wishes for a long and useful mission are extended to the *Quarterly Journal of Studies on Alcohol*.

The journal is published at 4 Hillhouse Avenue, New Haven, Connecticut. Subscription price \$3.00.

MINNESOTA EMPLOYMENT SERVICE

Every doctor knows the difficulties he faces when he finds it necessary to hire a new office girl, typist, stenographer, a laboratory technician or a registered nurse. Most of the trouble and annoyance usually encountered at such times can be avoided if the assistance of the employment service of the Division of Employment and Security is requested.

This governmental activity in Minnesota is under the direction of Victor Christgau. In pointing out that the service is free and is available to both employers and workers, Mr. Christgau says, significantly: "It's paid for. It should be used more!"

Under Mr. Christgau's administration, the service is being developed into an agency that serves the small employer in very much the same way as does the personnel department that all large business organizations find it so necessary to maintain.

The Minnesota Employment Service is a state-wide clearing house for workers and jobs—an organization that brings qualified people who seek employment to employers who have positions they want filled. Neither profit nor charity enters into its operations. It maintains the largest reservoir of employables in the state. Its records constitute a great pool of employee possibilities, a detailed examination of the more than 150,000 in approximately 3,000 different occupational classifications reveals.

When a doctor, for example, needs a new employee, all he has to do is to telephone detailed specifications to the nearest office of the state agency. There, trained placement officers search their files for workers who can meet these requirements. These placement officers are expert interviewers, men and women who have been specially trained and who know the qualifications that a given job requires. From their files they will refer one, two, three—or as many persons as the employer may desire to interview personally. From these referrals, the employer makes his own selection. In this way, he acquires a trained worker and loses no time interviewing a crowd of applicants. His time is not taken up by misfits.

The service of the Division of Employment and Security is state-wide and all its thirty-seven full time local offices can be reached by telephone.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

PREPARATION FOR MEDICAL DEFENSE

The first line of defense in modern warfare is medical defense and, unless this is adequately organized, success is impossible. The Council on National Defense is well aware of this and, as a first step in preparedness, requested that medical organization proceed at once. Although certain federal authorities, coöperating with politicians and a group of welfare workers, have made every effort in recent years to belittle the medical profession and besmirch organized medicine, with the threat of national danger they have been silenced and now hasten to acknowledge the profession's importance to public welfare. It should be stated, however, that the attitude of the Army and Navy has always been friendly and coöperative with the medical profession.

Important Issue

The most important issue before the medical profession today in any case is preparation for the national defense.

Physicians of America have never waited to be drafted for a national emergency. They have been ready and waiting whenever the need arose.

Today it is not a question of rushing out to enlist with the fighting forces. It is not a question of repairing the injuries of war. Instead, it is a question of organizing for a vital part in the preparedness effort of a nation.

Never again in America, it is to be hoped, will an actual declaration of war find a feeble fighting force bereft of equipment, and without the organized services of physicians ready at hand to judge the physical fitness of troops and workers, to rehabilitate the unfit and to care adequately for civilian needs at the same time that the overwhelming needs of the war injured are cared for.

To Provide Machinery

It is to provide the information and machinery for preparedness, not for war, that the new mobilization plan for physicians is now getting underway. The questionnaire sent out in July by the National Medical Preparedness Committee appointed by the American Medical Association in New York is the first step in that mobilization.

The National Research Council is also organizing representatives of the various fields of medicine so as to have available the most modern developments in medical progress. Plans are being made to set up schools of instruction in various fields, in order that those who are engaged in medical defense may be adequately instructed. Publication of a bulletin is being considered which will make information concerning recent developments immediately available.

This time the doctors of America are setting up their own organization for national defense as scientifically as they habitually set up their service for the care of the sick and the injured.

No Hit-and-Miss Enlistment

There is to be definite and detailed information about every physician on file in Chicago. Those who are likely to volunteer for war service, in case a war is declared, will be sent as they are needed to the places they are best qualified to fill. Those who will not for many reasons be assigned to fighting units will be marshalled at home according to the equally important need for proper selection of soldiers, for repair of correctible defects, for medical supervision of industrial workers and for uninterrupted service to the civilian population at home.

This time there will be no hit-and-miss enlistment of medical aid for the nation's defense forces and the questionnaire is the absolute essential guarantee of the new order.

Minnesota physicians have now received their questionnaires. Most of them have already sent them back carefully filled out to Chicago headquarters.

Reminder

A few still remain to be filed, however, and it is for the sake of the laggards, principally, that the post card plea of Dr. F. L. Smith of Rochester, State Chairman for the Committee on Medical Preparedness, went out to all members of the Minnesota State Medical Association this week.

The post card asked each member who had completed and mailed his questionnaire to notify the State Office on an attached card.

Thus all would be reminded of their duty, and also the state chairman would have in his possession a list of the doctors of Minnesota who had filled in the questionnaire to aid him in coöperating with the national committee.

Many a physician whose loyalty and willingness to serve in any capacity is beyond question, still finds it easy to postpone small chores like the filling and mailing of this questionnaire.

It is to these men that the state chairman and officers of the Association address a special plea.

This, for the present, constitutes the full military duty of the average practicing physician and delay in complying will cast an undeserved reflection upon the patriotism and loyalty of the profession in Minnesota.

FOR NATIONAL COORDINATION

A ringing call for coördination of medical and public health services under a coördinator of medical and health preparedness for national defense was sounded in New York recently by Surgeon General Thomas Parran.

The need for such a coördinator in times of peace as well as in times of stress such as these, has long been clear to the doctors of the country. The considerations which have kept the health agencies of the Children's Bureau separate and independent of those under the Surgeon General of the Public Health Service and have tried to bestow upon still another quarter federal efforts to aid industrial health, have been compounded of politics, personalities and precedents inherited from an earlier and simpler time. This is the time to strike hard for unified cohesive

federal health services under competent medical control.

At the same time, it is a time for watching closely that no standards of freedom, independence and scientific quality, be sacrificed in a frenzy to convert the medical services of the nation over night into a strong arm of national defense.

Dr. Parran's address as printed in the *Journal of the American Medical Association* should be read by every physician for its provocative review of the immediate problems to be faced by physicians in bringing America to an adequate state of preparedness. His remarks on the subject of coördination are reprinted here for especial emphasis on this problem of coördination and leadership in the United States.

Health, Military Problems Inseparable

Said Dr. Parran:

"In time of stress, the health problems of the military and civilian population are inseparable. At present they are the responsibility of many unrelated Federal agencies having the happiest personal good will toward one another, but with no more official authority or compulsion toward coördinated action than did an airplane factory and an automobile plant two months ago. Each of these agencies legally can perform only certain functions set up by law. None of them has a close, working integration with the organized medical and public health professions. The State Health Departments are as diverse as the forty-eight states. None of the official agencies have the benefits of a full working relationship with the great voluntary associations for health and welfare, in which doctors, dentists, nurses, engineers, in their technical capacity, work side by side with citizens to caulk up the leaks in the hull of our national manpower. None of the official agencies has the full aid and service which the public spirited foundations set up to promote health and welfare are able to give. . . .

"I Propose a Coördinator"

"Our defense plans, for the immediate emergency, are still young. There is much in the way of organization and coördination yet to come. But as a first step in meeting the vital needs of manpower preparedness, I propose that a coördinator of medical and health preparedness for national defense be appointed under the National Defense Council. There is much for him to do. He would work with and through the Surgeons General of the U. S. Army, the U. S. Navy, and the U. S. Public Health Service, other Federal agencies, and the national voluntary organizations concerned with the prevention, diagnosis, and treatment of disease.

"A first task is the need for listing and classifying professional and technical personnel in the country;

for planning and aiding, if and when necessary, the recruitment and mobilization of medical and health personnel. . . .

"If or when war comes, every 1,000,000 men mobilized need 7,500 doctors drawn from civil practice. Dentists, nurses, sanitary engineers are needed too. In the mobilization of four million during the last war, more than a fourth of the effective medical men of the country were called to the colors. Whole counties were depleted of doctors. Many medical schools were almost put out of business, because the best men left for military duty. We should not repeat these mistakes. Today we should investigate who should go, who should stay to practice, to teach, to operate an essential civilian service. We have no machinery now to do this. A Coördinator of medical and health preparedness should create the machinery, working with the public health agencies, the schools, and the medical profession itself.

Malnutrition Cited

"If our workers are malnourished, they cannot be efficient in producing what we need for defense. Yet every survey of nutrition, by whatever method conducted, shows that malnutrition in this country is widespread and serious. For example, studies by the Department of Agriculture show that forty per cent of the people are not getting a diet adequate to maintain good health and vigor. Eight out of every ten in this category do not have an income sufficient to purchase, at market prices, a diet adequate in amount and kind; this in spite of the fact that the foods of which the Nation has an apparent surplus are those in which the dietary of so many is deficient—milk and milk products, citrus fruits, green vegetables, and meat.

"Not through any pity for their working people, but because their scientists proved to them it was an essential to national power, the Germans began several years ago to provide for the working masses a diet better than ours have now. We have made a beginning in this direction through the foodstamp plan. What we need is an intensive national drive, with rigid scientific controls, to use the food we have to improve the fitness of our manpower.

"There is no time for dogged adherence to outworn patterns, nor for a major change in proved forms of medical practice. Medical science grows, expands, opens up new possibilities for saving life and building strength. In the application of its basic sciences, medical practice must expand also to meet the new demands of the Nation for self-preservation."

"THREE YEARS COULD BE SAVED"

It is interesting at this time to recall that many efforts were made to modify or lower standards of licensure and medical graduation after the United States entered World War I.

The matter was discussed according to the *July Bulletin of the Federation of State Medical*

Boards of the United States, at Federation meetings in February, 1917, and again at the annual session in 1918.

One board member declared that it was the obligation of the medical boards to protect and help humanity rather than look entirely to the preferment of doctors and that medical boards should be "reasonable and considerate to meet the needs of the times."

It was proposed that three years could be saved in preparatory education and another year could be eliminated from the medical course if men were taught only the things which are really essential to the making of a good general practitioner. The author further urged that "this great medical protectorate of federated medical boards assume the responsibility of establishing a new order of things" and create a committee forthwith with power to act.

"When it is made reasonably easy for men to become real doctors," the author declared in a quotation that should be of particular interest to medical educators today, "they will cease being cultists, and if we, as medical boards, are really trying to help humanity, this will aid us in the accomplishment of our duty."

Standards to Be Upheld

Fortunately, these proposals were vigorously opposed by other members of the federation.

In the event of another national emergency, the *Bulletin* declares, the Federation will again take a firm stand in upholding the highest standards of medical training required for efficiency in civil and military medical practice.

"PUBLIC LIABILITY INSURANCE"

(Monthly Editorial Prepared by the Medical Advisory Committee)

Recently, two cases brought to the attention of your medical Advisory Committee have made the discussion of the relationship between Physicians' and Surgeons' Liability (Malpractice) Insurance and Owners', Landlords' and Tenants' Public Liability Insurance pertinent.

In both cases injury followed closely on surgical treatment and loose interpretation of the points involved may place the defense within the wording of either or both of the policies carried.

The usual Malpractice Policy provides defense

for the Insured in event of legal procedure and indemnity for loss or expense resulting from claims for damages on account of malpractice, error or mistake committed or alleged to have been committed by the Insured in the practice of his profession, while the Owners', Landlords' and Tenants' liability policy indemnifies the insured against loss resulting from legal liability due to accidental injuries suffered by persons other than employees in the insured premises due to "ownership, care, maintenance or use" of the office quarters, including accidents involved in making ordinary repairs. This insurance would cover loss not included in the Physicians' Liability policy which provides only for losses due to the practice of his profession.

It is the thought of your Committee that it might be well for members of our Association to carry both. The cost would be little additional. The security and peace of mind warrants the small outlay. The defense, of course, would have fewer complications and would be facilitated generally if both policies were carried in the same indemnifying company.

—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Supreme Court of Minnesota Upholds Mower County District Court in Denying Austin Physician and Fraternal Order of Eagles an Injunction against the Minnesota State Board of Medical Examiners

Re: Fisch, et al. vs. Sivertsen, et al.

On June 21, 1940, the Supreme Court of Minnesota in a unanimous opinion, sustained the District Court of Mower County in dismissing the lawsuit instituted by Dr. Herbert Matthew Fisch, a physician and surgeon of Austin, Minnesota, and Lookout Aerie No. 703, Fraternal Order of Eagles, against the Minnesota State Board of Medical Examiners.

The Honorable Norman E. Peterson, Judge of the District Court for Mower County, had made an order on October 21, 1939, dismissing the plaintiffs' lawsuit, and on December 21, 1939, Judge Peterson made a further order denying the plaintiffs a new trial; it was from this order that the plaintiffs appealed to the Supreme Court of Minnesota.

The plaintiffs instituted the lawsuit in July, 1939, following an informal hearing held by the Minnesota State Board of Medical Examiners, and after a ruling by the Honorable J. A. A. Burnquist, Attorney General of the State of Minnesota, and Mr. John A. Weeks, Assistant Attorney General, that the Fraternal Order of Eagles and Dr. Fisch were violating the laws of the State of Minnesota, and particularly those relating to the practice of healing and the practice of medicine. The Attorney General also ruled that any physician who was

a party to the operation of such a plan, subjected himself to the possible loss of his license as a physician. The legal objection to the operation of such a plan is that the Fraternal Order of Eagles, a corporate entity, acts in the capacity of an intermediary in the practice of medicine contrary to law and usurps the privilege and franchise of the practice of medicine, in violation of law. The plaintiffs attempted, in their lawsuit, to enjoin the Minnesota State Board of Medical Examiners from interfering with the plan and also from taking any action to suspend or revoke Dr. Fisch's license as a physician. As originally instituted, the lawsuit was also brought against the members of the Mower County Medical Society, but the plaintiffs voluntarily dismissed their case against those defendants when the case was called in Court.

As operated, the Fraternal Order of Eagles at Austin, charged its members \$12.50 per year dues, and out of this amount the sum of \$4.00 per year per member was allocated for medical care, the money being divided equally between Dr. Fisch, a physician and surgeon, and Dr. Nicholsen, an osteopath.

Following the Supreme Court's decision and under date of July 15, 1940, Dr. Fisch notified the Minnesota State Board of Medical Examiners that he had resigned as Aerie Physician at Austin.

License of Hastings Physician Suspended for Three Years in the Matter of the Revocation of the License of Norbert J. Kulzer, M.D.

On July 12, 1940, the Minnesota State Board of Medical Examiners, following a hearing, suspended for three years the license to practice medicine held by Norbert J. Kulzer, M.D., of Hastings, Minnesota. The Medical Board found Dr. Kulzer guilty of immoral, dishonorable and unprofessional conduct as defined by law. The complaint against Dr. Kulzer grew out of Dr. Kulzer's alleged misconduct with a woman patient. Dr. Kulzer frankly admitted his guilt, but pleaded extenuating circumstances, and begged for leniency.

Dr. Kulzer was born at Melrose, Minnesota, in 1905, and graduated from the Medical School of the University of Minnesota in 1933. He was licensed in Minnesota by examination in 1934.

STATE LABORATORY FACILITIES

The Division of Preventable Diseases of the Minnesota Department of Health is open Saturday mornings for routine examinations. Specimens considered to be emergencies by the physicians submitting them will be examined Saturdays or Sundays on special request. Due to a misunderstanding, physicians have been under the impression that these laboratories operate on a five-day week. This is not true, since the laboratories are open 365 days in the year.

To serve physicians who occasionally must have specimens examined immediately, service is available in the morning on Saturdays, Sundays and holidays, and a twenty-four-hour service is maintained for pneumococcus typing. Although the Division of Preventable Diseases requests that emergency work be kept at a minimum, its facilities are available seven days each week.

MINNESOTA DEPARTMENT OF HEALTH

A. J. Chesley, M.D.

Secretary and Executive Officer

MINNESOTA MEDICINE

OF GENERAL INTEREST

A practice has been established in Badger by Dr. Herman J. Holte, formerly of Seattle, Washington.

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Dr. E. L. Baker of Minneapolis rounded out thirty years of practice in Minneapolis, July 15.

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A new hospital building was recently opened in Tracy under the guidance of Dr. W. H. Valentine.

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Dr. and Mrs. Walter H. Ude of Minneapolis spent a month's vacation in Alaska and the Canadian Rockies. They left Minneapolis, June 22.

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Dr. Meyer Z. Goldner has opened offices at 1129 Medical Arts Building, Minneapolis, for the practice of orthopedic surgery.

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Dr. Milo H. Larson, of Norwood and Cologne, has returned to Nicollet, repurchasing his practice and the Nicollet Hospital.

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Drs. John A. C. Leland, Jr., and Frederic F. Wipperman have been commissioned Lieutenants (junior grade) in the Medical Corps, U. S. Naval Reserve.

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Dr. N. F. Musachio, who has been associated in practice with Dr. Clarence Henry of Milaca for the past year, will locate soon in Foley, it is announced.

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Dr. A. E. Osterberg of Rochester attended a meeting of the Committee on Chemical Service to Medicine of the American Chemical Society in Ithaca, New York, June 28.

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Reclassification of employees of the Minnesota State Department of Health under the new civil service act is under way, and adjustments are now being made in the department.

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Dr. and Mrs. W. B. Dublin of Rochester have gone to Fort Steilacoom, Washington, near Tacoma, where Dr. Dublin has become associated with the Western State Hospital as pathologist.

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To become associated with the Lemley Clinic at Rapid City, South Dakota, Dr. R. S. Ahrens has resigned as assistant superintendent of the Fergus Falls State Hospital.

* * *

After practicing medicine in Nicollet village since April, 1939, Dr. C. F. Wohlrabe has moved to North Mankato where he has opened an office at 300½ Belgrade Avenue.

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Dr. R. K. Dixon of Denver, formerly of Rochester and St. Charles, flew to Minnesota to participate in dedicatory exercises of Crystal Springs trout ponds near St. Charles, June 29.

Dr. William A. O'Brien of Minneapolis will give the banquet address at the meeting of the American Hospital Association in Boston, September 19. His topic will be "An Education Program for Hospital Administrators."

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Dr. C. L. Warren of Chicago, a former Minnesota physician, passed away June 25 in Chicago. His wife and four children, Eugene, Clark, Florence and Chester, survive. Dr. Warren practiced at LeRoy and at Brewster.

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Dr. Robert S. Hunt, a graduate of Northwestern University Medical School, has located at Fairmont where he is associated with Dr. R. C. Hunt in the Hunt Hospital. He interned at St. Mary's hospital in Minneapolis and at the Cook County Hospital, Chicago.

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Dr. Hugh R. Butt of Rochester addressed a meeting of the American Association for the Advancement of Science, research conference on the subject of vitamins, at Gibson Island, Baltimore, July 19. His subject was "Clinical Studies of Vitamin K Deficiencies."

* * *

Winners of Hospital Day awards, as announced by the Council on Public Education are: large hospital class, the Nopeming Sanatorium of which Dr. A. T. Laird is the director; small hospital field, the Glenwood Hospital, of which Dina Bremness is the superintendent.

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Dr. S. Marx White of Minneapolis has been elected to the Hennepin County Sanitarium commission. He succeeds Dr. F. E. Harrington. Dr. White previously served on the commission for eighteen years, from 1919 to 1937.

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Dr. J. A. O'Hanlon has opened an office in Norwood, Minnesota. A graduate of the Marquette University Medical School at Milwaukee, he has been associated with the Webber Clinic in Duluth for the past four years.

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New Diplomates of the American Board of Obstetrics and Gynecology through qualifying in the June examination held in Atlantic City are Drs. Charles Hugh McKenzie, Owen Francis Robbins and William Paul Sadler of Minneapolis.

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Dr. Rollin E. Cutts, until recently of Minneapolis, is associated with the department of child hygiene in the Illinois State Department of Health at Springfield, Illinois. While practicing in Minneapolis, he was on the staff of the University of Minnesota Medical School, pediatrics department.

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Dr. Morris Fishbein of Chicago, editor of the *Journal of the American Medical Association*, addressed members of the Mayo Clinic staff and Fellows of the Mayo Foundation, July 26, at the Mayo Foundation

House in Rochester. His topic was "Problems Involving Medical Preparedness."

* * *

Dr. L. C. Barr and Dr. D. L. Donovan have become associated in practice in Albert Lea, establishing offices at 306 Freeborn County National Bank Building on South Broadway. Drs. Barr and Donovan practiced with the late Dr. H. D. Burns of the past five years, though recently Dr. Barr had offices of his own.

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Dr. John E. Low of Saint Paul has become associated in practice with Dr. J. J. Ederer at the Mahnomen Hospital in Malmomen. Dr. Low, who received his M.D. degree from the University of Minnesota Medical School this year, interned at Ancker Hospital in Saint Paul.

* * *

Dr. H. M. Keith of Rochester was renamed president of the Minnesota Mental Hygiene Society at a meeting of the board in June. Other officers are Mrs. Stella Ames of Saint Paul, vice president; Miss Elizabeth Glynn of Minneapolis, secretarp; Stanley Hedstrom of Saint Paul, treasurer.

* * *

Dr. Theodore F. Hammermeister has resumed his practice of general medicine and surgery in New Ulm after a prolonged leave of absence. He is president of the Union Hospital Medical Surgical Staff and vice president of the Loretto Hospital Medical and Surgical Staff.

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Three papers were presented by Dr. John S. Lundy of Rochester at a meeting of the Pacific Northwest Medical Association in Spokane, Washington, in July. The papers were: "Intravenous Anesthesia with Pentothal Sodium," "Choice of Anesthetic" and "Regional Anesthesia; Its Place in Present-day Anesthesia."

* * *

A new appointment to the University of Minnesota Medical School faculty is that of Dr. Lemen Jonathon Wells, who has been named associate professor of medicine. Dr. Wells held the posts of instructor of anatomy at the University of Missouri from 1935-37, and of assistant professor of anatomy since 1938.

* * *

The Minnesota State Department of Health has set up division headquarters at Little Falls to supervise sanitary engineering and public health aspects, as 50,000 men mobilize during July and August in the largest troop mobilization ever to be conducted in the state. Directing operations are Dr. Ralph R. Sullivan and Harold A. Whittaker.

* * *

Dr. and Mrs. Robert N. Bowers, who were married March 9, are making their home in Mazeppa, where Dr. Bowers began practice on August 1, 1940. A graduate of the University of Minnesota Medical School, Dr. Bowers recently completed an internship at Grand Hospital in Columbus, Ohio. Mrs. Bowers is the former Miss Lenna Guthrie of Columbus.

* * *

Dr. Ole Heiberg, a graduate of the University of Minnesota Medical School in 1935, has opened a prac-

tice in Montevideo. His offices are in the Security Bank Building. After graduating from the University, Dr. Heiberg was resident physician in the Minneapolis General Hospital for three years. For the past two years, he has been a member of a clinic in Manhattan, Kansas.

* * *

Dr. Carl W. Anderson, national champion of hurdlers in 1923-24 and now assistant medical director of the Northwest National Life Insurance Company of Minneapolis, was an official at the National inter-collegiate track meet staked at the University of Minnesota in June. He acted in the capacity of Judge of the finish. Dr. Anderson was the United States hurdler representative in the Olympic games in 1924.

* * *

Two Virginia, Minnesota, clinics will occupy offices on the second floor of a new building now being erected at Second Street South and Third Avenue in that city. The Malmstrom & Sarff Clinic, and the Morsman Eye, Ear, Nose and Throat Clinic expect to move into the building about September 1. About thirty rooms are being provided for offices and laboratories on the second floor.

* * *

Worthless checks have been passed recently in two Minnesota towns by a man who represented himself as a "Dr. Daly," looking for a location to open a practice. The checks were drawn on a Montevideo bank and came back marked "Unknown." Investigation reveals no person of that name in Montevideo. Physicians should be warned against similar attempts in other towns.

* * *

Dr. A. G. Sanderson has been elected president of the Riverside Sanatorium in Granite Falls. He fills the vacancy created by the death of Timothy O'Connor of Renville. Dr. G. H. Mesker of Olivia was chosen vice president. Members of the purchasing committee are Dr. H. A. Roust of Montevideo, B. A. Deterling of Granite Falls and Dr. Sanderson. Dr. L. S. Jordan is superintendent and medical director.

* * *

The practice of the late Dr. H. D. Burns of Albert Lea has been purchased by Dr. D. S. Branham, his former associate for ten years, and Dr. S. A. Whitson of Alden. They have taken over Dr. Burns' office in Albert Lea, and will also continue the Alden practice of Dr. Whitson who was located in that city for twelve years. Dr. Branham and Dr. Whitson have been associated in the practice of surgery for the last four years.

* * *

Dr. Harold S. Diehl, dean of medical sciences at the University of Minnesota, heads an all-university committee appointed to coördinate the university's efforts to coöperate in national defense efforts.

The defense efforts include: pushing two medical school research projects, one of which is concentrated on medical surgery and the other on human fatigue; organization of the United States General Hospital No. 26, comprising about forty medical officers; training men in the naval R.O.T.C.; participating in the civil aeronautics authority flight program; and the loaning of Dr. Elvin B. Stakman, internationally known plant

pathologist, to a federal expedition to South America to study possibility of expanding rubber production.

The university is one of four selected to assist in studies of the impact of the preparedness and defense program on business.

* * *

Equipped with the most modern facilities, two new neuro-surgical operating rooms have been opened at St. Mary's hospital in Rochester. They were built at a cost of more than \$50,000. A feature of both rooms is a glass screen which separates the operating surgeon from surgeons and nurses who may be observing. Communication is possible by means of a sliding panel in the glass. An x-ray cabinet on the wall allows the operating surgeon to study x-rays of the patient while he is working. For the benefit of spectator surgeons, a moving picture of similar operations may be exhibited in the room as an operation is being performed.

* * *

Dr. J. C. Litzenberg, professor emeritus of the Department of Obstetrics and Gynecology at the University of Minnesota Medical School, was elected president of the American Gynecological Society at the organization's meeting in Quebec, June 17-19. Dr. Litzenberg was also re-elected to the American Board of Examiners of Obstetrics and Gynecology for a five-year term.

Dr. M. J. Shapiro of Minneapolis has been named a member of the American Heart Association committee for the study of rheumatic diseases, which will devote its time to setting up standards for the care of children with rheumatic fever. The committee will publish a pamphlet on this subject early next year under the editorship of a special committee, composed of Dr. Shapiro, Dr. Edward F. Bland of Boston and Dr. Helen Brooke Taussig of Johns Hopkins Hospital in Baltimore.

Dr. Shapiro presented a paper before the American Heart Association at its meeting in New York City in June.

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Among the new names in the 1940-1941 edition of "Who's Who in America," are those of sixteen Minnesota physicians. In all, there were seventy-five Minnesotans included in the volume for the first time.

New from Minneapolis are the names of Drs. George Edmeston Fahr, Arthur Douglass Hirschfelder, John Leyland McKelvey and John Charnley McKinley.

Dr. Everett K. Geer is new in the Saint Paul list.

New on the Rochester list are the names of Drs. Arlie R. Barnes, David M. Berkman, Albert C. Broders, Fred W. Gaarde, Herbert Z. Giffin, Howard K. Gray, Norman M. Keith, Frank H. Krusen, Charles W. Mayo, Robert D. Mussey and Gordon B. New, all of the Mayo Clinic staff.

Among the most outstanding members of the "Who's Who" family who have died during the biennium and consequently are no longer recorded in the volume are Dr. Charles H. Mayo and Dr. William J. Mayo. Of the sketches in the previous edition, that of Dr. Charles H. Mayo was the longest. The new edition has 31,752 names, as compared with 8,600 in the initial volume published in 1899.

The University of Minnesota medical class of 1920 has taken over the first annual membership campaign for the Minnesota Medical Foundation, it is announced by Dr. Erling S. Platou, president.

The campaign will wind up with a scientific program and reunion to be held in connection with Homecoming on the University campus next fall. Meetings will be held in the new Minnesota Union.

Membership in the Foundation is increasing rapidly and is far beyond the expectations of those first interested in this foundation of medicine, which is for all alumni and friends of the University Medical School. The Foundation prints a bulletin containing scientific articles, which is sent to all members.

A great deal of interest in the Minnesota Medical Foundation was evidenced at the reunion of the Minnesota medical alumni held at the Madison Hotel in New York City during the meeting of the American Medical Association. Approximately fifty persons, including many residing in the East, attended the reunion, at which short informal talks were given by Dr. H. S. Diehl, Dr. Platou and Dr. Harold G. Benjamin, president of the Minnesota Alumni Association.

* * *

July 14 was "Ridgway Day" in Annandale, residents honoring Dr. Alfred M. Ridgway, who noted his fiftieth anniversary as a physician in that city.

Beginning practice in the "horse and buggy days," Dr. Ridgway has been the family friend, neighbor and dependable confidant of hundreds and hundreds of Annandale people in his fifty years of medical service in that community.

Regarding Annandale as a temporary location when he came there in 1890, Dr. Ridgway stayed on as his practice kept increasing each year. As "country doctor," Dr. Ridgway first used a two-wheel cart pulled by a single horse on his visits to patients through the countryside. Later, he had six horses (eight in the winter). His first motorized vehicle was a one-cylinder chain-drive Cleveland, which gave him wonderful mechanical experience.

For the past forty years, Dr. Ridgway has been a physician for the Soo Line railroad, being given that appointment following a train wreck near Maple Lake at which he gave passengers medical aid. He belongs to the Soo Surgical Society and the Interstate National Railroad Surgeons, as well as the Minnesota State and American Medical Associations. Dr. Ridgway helped to organize the Wright County Medical Society nearly fifty years ago.

Before studying medicine, Dr. Ridgway was a registered pharmacist in Minneapolis. To obtain funds to study medicine, he opened a real estate office in Minneapolis in January, 1886. Business was so good that in September he had enough money to enroll in the University of Minnesota Medical School. He interned at the Minneapolis General Hospital.

Since 1930, Dr. Ridgway has been assisted in his practice at Annandale by Dr. Lester H. Bendix, a graduate of the University of Minnesota Medical School in the class of 1930.

In Memoriam

Hiram D. Burns

Dr. Hiram D. Burns, for nearly twenty-five years one of the leading physicians of Albert Lea, died very suddenly June 19 while visiting his farm near his home.

Dr. Burns was born at Litchfield, Minnesota, March 20, 1889. He spent his boyhood in Minneapolis and at Omaha where he graduated from high school in 1908. He received his medical degree from the University of Nebraska Medical School in 1914. At medical school he was a member of the Phi Rho Sigma medical fraternity. His internship was served at the Clarkson Memorial Hospital of Omaha.

In 1915, Dr. Burns married Corinne Searle of Omaha and came to Albert Lea to practice.

Dr. Burns has shown an interest in community activities having been past-president of the Chamber of Commerce and the Rotary Club, a member of the Y.M.C.A. Board of Directors and the school board and a devoted worker in the First Presbyterian Church. He was a man of good judgment and of deep personal convictions in matters of civic affairs. He was not deterred by any type of opposition from giving able expression by word and action to his convictions. He was successful in his profession, a loyal friend—and will be greatly missed by this community, its hospital and entire staff. He was also a 32nd Degree Mason.

He was associated at first with the late Dr. R. G. Stevenson and later with Dr. Leo Donovan. He was a member of the Freeborn County Medical Society, the Minnesota State and American Medical Associations. At one time he served as president of his local medical society.

Dr. Burns' avocation was farming and he has built up some of the finest dairy herds in the country.

He is survived by his widow; a son, Robert Burns, and three daughters, Catherine, Alice and Marjorie. His mother, Mrs. Alice Burns, and a brother, Dr. Douglas Burns of Omaha, also survive.

—A. GULIXSON, M.D.

Malvin M. Hauge

Dr. Malvin M. Hauge of Clarkfield, Minnesota, died at his home on January 31, 1940, of myasthenia gravis, aged sixty-three.

Dr. Hauge was born in Bremangerpollen, Norway, February 6, 1876. Left fatherless at the age of one year, he spent the early years of his life as a clerk and sailor, traveling in foreign waters extensively, until shortly before he came to this country in 1897. He came directly to Minneapolis where he started as a student

at Augsburg Seminary. Dr. Hauge received his Master of Arts degree from Augsburg Seminary in 1902, and his Doctor of Medicine degree from Hamline University School of Medicine in 1907. In 1914, he took a postgraduate course in the postgraduate school of Medicine, University of Vienna, Vienna, Austria. In 1936, he became a member of the American College of Surgeons.

Dr. Hauge was married in Minneapolis, April 4, 1903, to Anna Schjelderup. He is survived by his wife and six children, Malvin, Cecelia, Waldemar, Erling, Bergliot, and Dagmar.

He began the practice of medicine in Clarkfield in 1907, continuing there until a few months before his death. In addition to carrying a large practice, Dr. Hauge was a leader in both civic and musical circles. He was a member of the Camp Release District Medical Society, the Minnesota State Medical Association, and the American College of Surgeons.

William D. Kelly

Dr. William D. Kelly was born in Saint Paul in 1864. He was the eldest son of Daniel and Mary Kelly, pioneer settlers of Saint Paul. He attended the parochial and public schools in Saint Paul, where he received his preliminary education. Later he entered the Philadelphia College of Pharmacy and after graduating from that institution he matriculated at Jefferson Medical College in Philadelphia, from which he received a degree in 1887.

Returning to Saint Paul he began the practice of medicine and was active in his profession until shortly before his death, which occurred in St. Joseph's Hospital, April 7, 1940. During the course of his medical career, Dr. Kelly served on the staff of both the Ancker and St. Joseph's Hospitals. He spent two years in the late nineties visiting the various surgical centers in continental Europe, and also visited clinics in Edinburgh and London.

He was a one time member of the American Medical Association, the Minnesota State Medical and the Ramsey County Medical Society. He was also an honorary member of the University of Minnesota chapter of Alpha Kappa Kappa fraternity. Dr. Kelly served for several years, beginning in 1904 with the rank of Major, in the hospital service of the Third Infantry of the State of Minnesota. For more than twenty years he was the medical representative of the Milwaukee Railroad in Saint Paul and also served as medical officer to the Federal Court of this district for many years. Dr. Kelly was an active member of the Junior Pioneers and the Knights of Columbus and a former member of the Benevolent Order of Elks.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR AUGUST

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

- August 3—Leg Cramps
- August 10—Hyperchlorhydria
- August 17—Embolism
- August 24—Sacro-iliac Disease
- August 31—New Dentures

AMERICAN BOARD OF OPHTHALMOLOGY EXAMINATIONS

The Board will hold only one written examination in 1941 and this will be in March in various cities throughout the country. Applications should be made before December 1, 1940.

Oral examinations will be held in May and October and a special one on the Pacific Coast if candidates warrant.

Address American Board of Ophthalmology, 6830 Waterman Avenue, Saint Louis.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The nineteenth annual scientific and clinical session of the American Congress of Physical Therapy will be held September 2 to 6, inclusive, at Hotel Statler, Cleveland, Ohio. This year there will be a departure from the usual arrangements in that the mornings will be devoted to an instructional seminar with the scientific program presented afternoons and evenings. This enables physicians to economize on time by attending both the instruction course and the annual convention during the same week.

Registrants may pursue only the individual courses they desire. The complete course consists of twelve lectures from a diversified list of forty-eight. The scientific program itself consists of papers, demonstrations and motion pictures covering every branch of physical therapy. There will be a separate scientific program covering eye, ear, nose and throat subjects. Write for schedule, fees, et cetera, to the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

AMERICAN NEUROLOGICAL ASSOCIATION RESOLUTION

The American Neurological Association, in its Executive Session at the Westchester Country Club, Rye,

New York, on June 7, 1940, unanimously passed the following resolution and directed its Secretary to send copies of this resolution to the Secretary of each State Board of Medical Examiners and to the editors of the *Journal of the A.M.A.* and of each State Medical Journal:

WHEREAS official statistics indicate that the immigration of refugee physicians is numerically small, representing in its totality less than 0.6 per cent of the practising physicians of this country;

AND WHEREAS such an influx of physicians from abroad cannot adversely affect the economic welfare of American physicians if the émigrés are distributed widely to those sections of the land in which they are needed;

AND WHEREAS information gathered from governmental and private investigations indicates that there are at least 2,000 communities in this land in need of immediate medical staffing which in large part cannot be supplied by the graduates of our own medical schools;

AND WHEREAS many of the demands for physicians come from states in which it has become impossible, either by reason of legal enactments or because of regulations of the State Boards, for the refugee physician to take his medical license examinations;

AND WHEREAS there now exists in New York a competent agency for diverting the unfit among the refugee physicians into non-medical fields thus making it possible only for those who are fit in training and in personality to be considered for examinations;

NOW THEREFORE BE IT RESOLVED that the State Boards of Medical Examiners in the United States shall create a uniform policy with regard to refugee physicians so as to make possible the wide distribution of these physicians to those places where they are needed throughout the land;

AND FURTHER that these uniform changes in the regulations of our State Boards shall be in the direction of the recommendations made by Dr. David L. Edsall in his article on "The Émigré Physician in American Medicine" (*Journal of the A.M.A.*, March 23, 1940, Volume 114, pages 1068-1073);

AND FINALLY that the Committee for Resettlement of Foreign Physicians of the National Refugee Service, Inc., 165 West 46th Street, New York City, shall be utilized as a clearing house for information in regard to available émigré physicians for specific placements.

—HENRY ALSOP RILEY, M.D., *Secretary.*

MISSISSIPPI VALLEY MEDICAL SOCIETY

The Sixth Annual Meeting of the Mississippi Valley Medical Society, "The Mid-West's Greatest Intensive Post-Graduate Assembly for General Practitioners," will be held at the Hotel Fort Armstrong, Rock Island, Illinois, September 25, 26, and 27, 1940. The program will be given by thirty-two clinician-teachers who will give over sixty lectures, demonstrations, round table discussions, et cetera. Further information may be secured from the Secretary, Harold Swanberg, M.D., W.C.U. Building, Quincy, Illinois.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of May 8, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 8, 1940. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the president, Dr. James Johnson.

There were thirty-eight members and two guests present.

Minutes of the April meeting were read and approved.

The scientific program followed.

EOSINOPHILIC LEUKEMIA OR MYELOGENOUS LEUKEMIA WITH EOSINOPHILIC HYPERLEUKOCYTOSIS.

Case Report with Discussion of the Medical Literature

J. A. LEPACK, M.D.

Saint Paul, Minnesota

Eosinophilic leukemia is a rare and much disputed disease. Only a few reports are found in the medical literature and some of those do not remain unchallenged. No doubt additional cases have been observed and studied but not recorded, because the very definition, description, and designation of what constitutes this condition varies so widely among scholars of hematology as to preclude a satisfactory discussion. The following case, typical or atypical as it may be, in accordance with the views expressed by the different hematologists, is, therefore, presented more to stimulate further discussion of the medical nature of this condition, rather than to add something new about it to our scientific knowledge.

Case Report

A man, single, aged forty-one, seeking relief for a backache, fever, abdominal distress, loss of weight, and severe pains in the hips and lower extremities, was admitted to St. Joseph's Hospital on December 1, 1939.

The past history revealed that in October, 1929, he had received treatment for a week in the hospital for chronic alcoholism, acute bronchitis, and nervous exhaustion. A month later a tonsillectomy had been per-

formed. In 1930 he received treatment again for chronic alcoholism in the hospital for two weeks. During these hospital stays, however, he had no blood examinations. On November 30, 1937, he entered the hospital on Dr. E. K. Geer's service and remained there until March 21, 1938. Positive tubercle bacilli were found in the sputum and it became necessary to collapse the left lung. He also developed an ulcerative tuberculous infection involving the proximal half of the ascending colon, the cecum, and terminal ileum. Stool examinations showed no parasites. Sedimentation rates on two occasions were 8 and 12 mm. for one hour, respectively. During this hospitalization several blood examinations were made and revealed a persistent eosinophilia.

The air in the left chest was then replenished about once a month and he remained quite well until September 1, 1939, when he was attacked by an upper respiratory infection. Gradually he grew worse and on November 15, 1939, he was tired, listless, feverish, pale and complained of severe backache, enlargement of the abdomen, abdominal distress, severe pains in the hips and excruciating aches in the lower extremities. The examination now revealed, in addition to the previous findings an enlarged liver, a large tender spleen, and a fever of 100 degrees. A myelogenous leukemia existing concomitantly with the tuberculous processes was suspected and hospitalization was advised, but delayed until December 1, 1939, when the night sweats became severe, cough marked, fever 101 degrees, dyspnea pronounced, pain more severe in the left side of the abdomen and the patient semiconscious. On admission urinalysis showed a faint trace of albumin and many hyaline and granular casts. Blood examination showed: hemoglobin 82, red blood count 4,180,000, white blood count 40,300; polymorphonuclear 45 per cent, eosinophils 30 per cent, basophils 4 per cent, small lymphocytes 11 per cent, large lymphocytes 5 per cent, monocytes 5 per cent, metamyelocytes 1 per cent, myeloblasts, 4 per cent, myelocytes 6 per cent, band cells 6, non-S-shaped 7, multilobed 21, and the laboratory commented: "Summary of findings indicates a marked myeloid reaction, which probably represents a myelogenous leukemia, although the picture seems to be atypical. The eosinophilia and toxic changes have been seen in previous examinations and the above picture seems to be superimposed upon these findings." An X-ray picture of the abdomen confirmed the presence of a large spleen extending down to the level of the iliac crest. In spite of the usual supportive measures, on the second hospital day the patient became comatose and the temperature rose to 102.4 degrees, on the third day to 105 degrees, and on the fourth, just before death, to 106.8 degrees.

Due to the peculiar temperament of the family, it is to be regretted, no punctures nor special studies were

BLOOD EXAMINATIONS

Date	12-1-37	12-22-37	2-2-38	2-5-38	3-12-38	9-15-39	12-1-39
Hemoglobin	102		94	94	94	86	82
Red Blood Cells	5,470,000		4,920,000	4,820,000	4,820,000	4,460,000	4,180,000
White Blood Cells	9,450	12,250	11,800	11,550	15,550	12,100	40,300
Polymorphonuclears	40	35	50	34	50	32	45
Eosinophiles	15	20	12	11	19	25	30
Basophiles	1	1	0	1	0	2	4
Small Lymph	24	21	15	27	4	26	11
Large Lymph	10	17	17	23	19	9	5
Mononuclears	10	6	5	4	8	6	5
Myeloblasts	..	..	..	..	..	..	..
Myelocytes	..	..	..	..	..	1	6
Metamy.	1	..	1	..	..	..	1
Band Cells	19	11	10	6	8	5	6
Non-S-shaped	9	2	7	4	15	3	7
Multilobed	11	22	32	24	27	23	21

permissible, either before or after death, of the bone marrow and spleen and hence the scientific data of the case remain incomplete and inconclusive and thus invite justifiable argument and conjecture regarding their nature.

Comment

The most striking feature of this case is the marked eosinophilia. According to Downey⁶ eosinophilia frequently accompanies a great many diseases or disorders, some of which are: (1) parasitic infestations, like malaria, hookworm, trichinosis; (2) infectious diseases, as asthma, endocarditis, scarlet fever, rheumatic fever, intestinal tuberculosis, chronic colitis, Hodgkin's and Addison's diseases, leprosy, purpura, pyelitis and pneumonia; (3) dermatoses, like dermatitis herpetiformis, pemphigus, bulbous dermatitis, scabies, mycosis, fungoides and urticaria; (4) constitutional disturbances, such as, treated pernicious anemia, post-splenectomy, vagotonia, osteomalacia, polycythemia, gout; (5) malignant tumors; (6) drugs, like camphor, coal tars, gold, and toxic conditions due to foreign proteins.

It is reasonably certain that all the above conditions can be excluded in this case except the tuberculous colitis. That a tuberculous process of the intestines could become so severe and fulminating as to produce in the terminal three weeks of life an enlarged liver, an enormous spleen, and so active a myeloid reaction seems unlikely. Familial eosinophilia occurring not infrequently, as one notes from the excellent review of the literature and the report of eosinophilia in four families by Stewart,¹⁶ was also eliminated. To maintain, again, that this was just an individual constitutional eosinophilia appears both groundless and defenseless.

Since hematologists today recognize the ability of a leukemia to develop from the primitive myeloid cell stems or elements that eventually appear either as the polymorphonuclear neutrophil, basophil, or eosinophil, the classification and determination of each kind of leukemia would be definite and indisputable if the basophilic and eosinophilic leukemias behaved like the neutrophilic type. Unfortunately the basophilic as well as the eosinophilic types of leukemia resemble, as Groat, Wyatt, Zimmers and Field⁹ have shown, each other by keeping "toward the mature"—instead of the immature cell in the circulating blood "regardless of the company they keep." This is also true of the case under discussion. Nearly all of the eosinophils are mature. Most hematologists detest making a diagnosis of leukemia on predominantly or nearly exclusively mature cells, yet many admit the possibility that an eosinophil or basophil might well behave in such a manner and appear in the mature form in basophilic or eosinophilic leukemia. Some, therefore, are accepting reluctantly the diagnosis of eosinophilic leukemia, while awaiting a definite solution. Others again, prefer to designate such a condition as a myelogenous leukemia with eosinophilic hyperleukocytes or eosinophilic hyperleukocytosis with splenomegaly. The trend of medical writers, however, leans toward the retention of the designation of eosinophilic leukemia, at least, until there is a better understanding of this condition.

Brief Review of the Literature

Hays and Evans¹¹ in a masterly review of the subject of eosinophilic leukemia attributed the first report to Stillman¹⁷ in 1912, under the title "Myeloid Leukemia with Preponderance of Eosinophil Cells." The subject was a man, aged 27, who showed an enlarged liver, spleen and cervical, inguinal and epitrochlear glands. The blood Wassermann was positive and the urine contained a trace of albumin and some casts. The white cells varied from 118,000 to 165,000 per c. mm. of which number 85 to 91 per cent were eosinophils (polymorphonuclear 69.8—metamyelocytes 19.4—myelocytes 1.8). It is stated that the eosinophils were larger than normal, but the granules somewhat smaller. What happened later to the patient is unknown. Giffin⁸ studying a man, aged thirty-one, who complained of dyspnea and pain in the chest, found in addition to marked evidences of cardiac decompensation, a large liver, spleen, and axillary glands. The white count was 15,400, of which 66 per cent were eosinophils but myelocytes were very rare. After the removal of the spleen, which weighed 2,100 grams, the white count reached 208,000 in ten months and the eosinophils accounted for 79 to 90 per cent. After six years death ensued. The necropsy revealed a broncho-pneumonia, chronic pleurisy, obliterative pericarditis, fibrous perihepatitis, cirrhosis of the liver and a hyperplastic bone marrow. He concluded thus: "I am inclined to regard the case as an instance of eosinophilic hyperleukocytosis, the blood picture of which was remarkably altered by splenectomy." Shapiro¹⁴ reported a man, aged forty-nine at death, with a five year illness, who had a large spleen and liver and palpably enlarged inguinal and epitrochlear lymph nodes. The Wassermann was strongly positive and the white count read 19,800 with 70 per cent eosinophils. In less than a year it reached 236,000 with 79 per cent eosinophils, most of which were of the adult type. Autopsy showed a large liver, and spleen, and cellular marrow with numerous eosinophils, both myelocytic and polymorphonuclear, also numerous myeloblasts. He, therefore, came to the conclusion that this was a case of leukemia arising in the eosinophil system of cells. Again in 1922 McDonald and Shaw¹³ reported a man, aged forty-six, with digestive disturbances for several years' duration, who had a large spleen and white cell count of 34,000 with 71 per cent eosinophils. The removed spleen weighed 1,276 grams. Some fourteen months after the splenectomy, the white cell count had risen to 138,000 with 84 per cent eosinophils, of which around 98 per cent were the adult type and 2 to 8 per cent myelocytes. Sometimes basophilic granulations were mixed with the eosinophilic ones. The patient died within two years. No autopsy was done. The authors are inclined to view the case as more allied to leukemia than any other condition. Alexander¹ studying a man, aged forty-seven, five years after a splenectomy, noted marked asthenia, pronounced anemia and dyspnea. The spleen weighed 2,200 grams and had been removed for the anemia. While the blood count before the splenectomy was only 9,400 it was now 150,000 of which 24 per cent were eosinophils. Later the red blood count too

fluctuated between 1,200,000 and 4,300,000; the white count, between 19,000 and 70,000; and the eosinophils constantly averaged about 30 per cent. Necropsy showed a large liver and cellular bone marrow with many eosinophils. This case was considered to be an atypical form of myelogenous leukemia.

In 1925 Bass³ reported an unusual eosinophilia with splenomegaly in a child aged six. Clinically she had rickets, but in addition the spleen, liver and cervical glands were enlarged. The blood showed: hemoglobin 80, red blood count 4,300,000, white blood count 25,000 of which 64 per cent were eosinophils. Death followed from a broncho-pneumonia in two months, but no autopsy was obtained. Evans and Hays¹¹ described in 1928 a case of acute eosinophilic leukemia in a man, aged forty-one, which the course of the disease ran to a fatal termination in less than three weeks. The eosinophils constituted over 83 per cent of the total white blood count of 72,187. A study of the eosinophilic cell showed 75.5 per cent polymorphonuclear, 3.8 per cent myelocytes, and 4.4 per cent metamyelocytes. Furthermore, they varied considerably in size and seemed to be larger than normal. The granules, too, varied in size. Sometimes they appeared larger than normal but at times they were very fine or almost totally absent in certain areas of the cytoplasm. At autopsy the bone marrow was found to be very cellular and the spleen markedly infiltrated with eosinophils as well as the lymph nodes and liver. They state, "It is curious that in this as in other reported cases, the eosinophils were mainly of the adult type, considering the acute nature of the disease (three weeks) this case seems unique in medical literature."

Harrison,¹⁰ in 1930, reporting the case of a man, aged 33, who died of eosinophilic leukemia, called attention to the increased metabolic rate. The case showed a basal metabolism of plus 35 per cent and at autopsy in addition to the usual eosinophilic infiltration in all the organs contained multiple small hemorrhages in the lungs resembling tuberculosis. The white blood count averaged 13,000 to 16,000 of which 55 to 60 per cent were mature and one per cent immature eosinophils. Bass,⁴ reporting a second case in a boy, aged eight, in 1931, found also an increased basal metabolism, namely, plus 31 to 48 per cent. The white blood cells in this case were also predominantly mature, ranging from 32 to 76 per cent in eosinophils in a count of 26,400 to 47,000. Bone biopsy showed myeloid hyperplasia. Stephens¹⁵ reported a girl, aged seventeen, with severe petechial hemorrhages. An acute leukemic state became superimposed on a chronic form and the patient died in less than two weeks. The white blood count reached 130,000 of which 67 per cent were mature and one per cent immature eosinophils. Forkner's⁷ case, a man, aged thirty-three, reported in 1937, developed after an extraction of an upper molar tooth, severe weakness, sore throat, listlessness, and hemorrhagic spots over the whole body. The platelets fell to 5,000 and the leukocytes ranged between 118,000 and 254,000 of which 75 to 81 per cent were eosinophils. The whole course of the disease ran less than a month. In the acute form of eosinophilic leukemia,

the author states, the length of the disease runs from twelve days to three months.

Thomsen, Stig, and Plum¹⁸ studied a boy, aged eleven, with eosinophilic leukemia which followed an acute tonsillitis. After radiation the spleen decreased in size and the white blood count fell from 65,000 to 5,000, of which 70 to 90 per cent were eosinophils. Eight months later, however, the gradual growing enlargement of the cervical glands was treated again by radiation. After a stationary four-month period myeloblasts appeared in the blood stream, mature eosinophils disappeared and the bone marrow showed no further stem cells. At autopsy a leukemic condition of the bone marrow was found. This case showed in the clinical course a transition from the typical eosinophilic leukemia to an entirely myeloblastic leukemia. The authors in discussing eosinophilic leukemia state: "Hematologically it is characterized by an enormous, absolute and relative increase in the number of eosinophilic granulocytes, but the dominating cell-form has a particular mature appearance, with a segmented nucleus and coarse granulation. On close examination these cells are found to differ considerably from the normal eosinophil granulocyte."—They are considerably larger, and the nuclei are more loose in structure than normally. The protoplasm is more abundant, and most often distinctly basophilic, the granules are abnormally large, and their number is far smaller than in normal eosinophils: and often the granules are heaped together in a single accentuated group. Histologically the bone marrow, spleen, liver, kidneys, and lymph glands show marked infiltration with eosinophilic granulocytes essentially of the same form as described above."

Broadly speaking laboratory studies and clinical observations point to wide variations not only in the course of certain white blood cells but also in the response of the blood-forming organs. One is almost forced to admit that under favorable conditions, any white cell, be it a lymphocyte, mononuclear, basophil, eosinophil, or neutrophil may decrease or even disappear from the circulation or again increase slightly, moderately or overwhelmingly either in mature, mixed, or immature forms. Thus, for example, the mononuclear cell might be leukopenic, hyperleukocytic, as in infectious mononucleosis, or leukemic as in monocytic leukemia. Whether or not the immaturity of the cell, to the total exclusion of the predominantly mature character of the cell with fatal termination of the case, should be the only guide in designating or classifying basophilic and eosinophilic leukemias remains still a debatable question. The tendency, however, seems to be to accept a case as eosinophilic leukemia, which has a white blood count very high in eosinophils, a large spleen, large liver and enlarged lymph glands with a fatal termination despite the largely or predominantly mature character of the eosinophil. Downey,⁶ however, leans toward the acceptance, as myelogenous leukemia, of all the conditions showing immaturity of the polymorphonuclear cell in the blood stream, and a very actively increased cellular bone marrow, regardless of whether they make their appear-

ance through the eosinophilic, basophilic, or neutrophilic routes or systems.

Summary and Conclusions

1. A case of pulmonary and intestinal tuberculosis with a high eosinophilia extending over a period of three years is reported, terminating in the last three weeks of life with a large spleen, enlarged liver, fever, and an atypical bone marrow reaction suggesting, according to some hematologists, an eosinophilic leukemia and according to others a myelogenous leukemia with an eosinophilic hyperleukocytosis.

2. Emphasis is placed on the fact that basophilic and eosinophilic leukemias, if such exist, do not conform to the established and time-honored scientific prerequisites of a leukemia based exclusively on the immaturity of the cellular elements, since the eosinophils or basophils are predominantly mature.

3. A review of the reported cases in medical literature favors the retention of the nomenclature of eosinophilic leukemia, at least until adequate studies of scientific clarification either confirm, alter or reject this designation.

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17. Stillman, R. G.: Myeloid leukemia with preponderance of eosinophil cells. *Medical Record*, 81:594, 1912.
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Discussion

DR. E. K. GEER, Saint Paul: Inasmuch as I attended the patient to whom Dr. Lepak has alluded, for his tuberculosis, there are a few remarks I would like to make. In the first place, most tuberculous persons reveal no serious or marked blood changes. The most common blood finding in chronic pulmonary tuberculosis is hypochromic anemia of varying degrees, usually not marked. If it is marked, causes other than tuberculosis should be suspected. Of the serious blood dyscrasias, I have yet to see pernicious anemia in a tuberculous individual. I recall one case of chronic lymphatic leukemia which developed in a patient at Pokeg-

ama Sanatorium who was doing a good job of controlling her tuberculosis. If the case presented this evening is a true myelogenous leukemia, it is the first one I have seen coexisting with tuberculosis.

This patient made very satisfactory progress with artificial pneumothorax for his lung tuberculosis, his left upper lobe being closed thereby. The usual regime for intestinal tuberculosis controlled his enterocolitis and after leaving the hospital he remained well until an apparent throat infection in September, 1939, for which Dr. Lepak attended him. From this episode he did not make a complete comeback although he was up and around. In October, when he came to my office for his monthly pneumothorax refill he looked washed out, so I gave him a general physical examination. At the time no enlargement of his liver or spleen was apparent but a change was noted in his blood picture, premature cells being evident. He returned in a few days at my request to have this checked and then was advised to have consultation.

The next thing I knew of him was after his last admission to the hospital. The dramatic downhill course has been described by Dr. Lepak.

The eosinophilia which was noted while he was being treated in the hospital for tuberculosis was unexplained. He certainly was suffering from none of the disorders commonly associated with an increase of eosinophils in the circulating blood. When he developed symptoms suggesting a tuberculous enterocolitis and substantiating evidence was forthcoming with a barium enema, I was inclined to explain the eosinophilia on that basis, having noted it in the literature but never having seen it in patients under my care either before or since.

DR. H. Z. GIFFIN, Rochester: I think Dr. Lepak would want me to say something about the case I reported in 1919 which proved to be the second case in the American literature. The patient in that instance showed a very marked eosinophilia of from 70 to 90 per cent and developed a severe leukemoid reaction following splenectomy. At postmortem examination, an extensive chronic infectious process was found involving the pericardium and the peritoneum. Cases similar to Dr. Lepak's case and mine have been reported in the literature and I believe it is most logical to regard this particular type of case as not falling into the group of true leukemias. However, in the literature one finds three types of cases: (1) cases of chronic type in which the eosinophilia seems to be secondary to some other process; (2) cases in which the condition begins very much as it did in Dr. Lepak's case and in which, later, there develops a true picture of leukemia with many myeloblasts in the blood; and (3) a type in which the process is of very short duration and an acute myeloblastic leukemia develops. Four or five of these acute cases have now been reported and I do not see how we can regard them as entirely secondary, especially in view of the high percentage of myeloblasts present and the short history which, in some instances, is only of a few weeks' duration. For the sake of argument at least, I am willing to say that there are also two types of cases of the more chronic condition, one type which develops a leukemoid reaction and the other which is a true leukemia.

DR. JOHN F. NOBLE, Saint Paul: This case of Dr. Lepak's has been very interesting to me, particularly so because about a year previous to this case, we had a somewhat similar experience. I am not at all convinced that there is such a thing as a true eosinophilic leukemia. I say that on the authority of Dr. Downey, and the statement is supported by my own experience. Several years ago we saw a patient, a man, aged 28, who stated that he had been well until six years before his admission to the hospital when he developed asthma following an attack of bronchitis. During the first year

the asthmatic attacks were infrequent and were associated with respiratory infections. A change in climate gave the patient a year when he was free from symptoms, but after a recurrence of his asthma a similar change in climate gave him no relief. The patient had been taken care of by a number of physicians and he had received all the usual types of therapy, including vaccines, calcium gluconate, adrenalin and ephedrine. Protein sensitivity tests were negative, and clinically it was felt that the patient had asthmatic bronchitis on an infectious basis.

The eosinophilia was first noted in October, 1937, at which time there was 10.5 per cent present. A careful study of the smears at this time showed no abnormality. His complaint at the time of his admission to Ancker Hospital was severe abdominal pain of such degree that at one time a laparotomy was considered. There was a palpable mass in the left side of the abdomen which was thought to be the spleen. Our blood studies showed as high as 77 per cent eosinophils. About 6 per cent of promyelocytes were observed, but these were the most immature cells seen, though many of the eosinophils showed changes which were interpreted as slight immaturity. These changes were a lack of typical staining characteristics of the eosinophilic granules.

Clinically this patient was considered as a possible eosinophilic leukemia and even at autopsy the infiltration of his organs suggested this diagnosis. More careful study, however, showed that the picture was that of a periarteritis nodosa and not a leukemia. The palpable mass in the abdomen proved to be a massive retroperitoneal hemorrhage from an aneurysm of a small renal artery.

In reviewing the literature of periarteritis nodosa and eosinophilic leukemia, the similarity in the sex distribution, the clinical symptoms and the blood picture in the two groups of cases was striking, and I wonder how many of the cases of so-called eosinophilic leukemia may be periarteritis nodosa.

DR. MOSES BARRON, Minneapolis: This is a very interesting case that has been presented tonight and I am very glad Dr. Lepak reported it although I may disagree with his conclusions. An increased number of eosinophils is found in the blood of various conditions. In the foreign literature it is often reported that it is associated with some cases of tuberculosis. Loeffler described a syndrome of a peculiar spreading lesion in the lungs associated with an eosinophilia that ranged from 10 to 66 per cent. His cases were principally associated with tuberculous lesions and with asthma. In the case presented tonight it seems to me the blood picture did not show the presence of a sufficient number of myelocytes. Dr. Lepak stated that, although an eosinophilia had been present for several years, no promyelocytes, myelocytes or metamyelocytes were found until a month before death. One has to consider trichiniasis as a cause of eosinophilia. I do not believe that there is enough evidence in this case to consider it one of leukemia. It is difficult to state what was the actual cause of death. It is unfortunate that postmortem examination was not obtained. I would like to know how large the liver became, as well as the spleen. What was the blood picture at the time the diagnosis of leukemia was made?

DR. THOMAS J. KENYON, Saint Paul (by invitation): An eosinophilia was first noted in this patient in December, 1937, at which time it was 15 per cent. Another blood study was made in the latter part of December 1937 and revealed an eosinophilia of 20 per cent. During 1938, the eosinophilia ranged from 15 to 18 per cent. On September 15, 1939, the patient's hemoglobin was 86 per cent, the white count 12,100, red count 4,465,000, the color index 0.97. A differential count revealed the polymorphonuclears to be 32 per cent, the eosinophils 25 per cent, basophils 2 per cent,

lymphocytes 35 per cent, and the monocytes 6 per cent. Of the neutrophilic series alone, 1 per cent were myelocytes and 5 per cent of them were band cells. On December 1, 1939, the hemoglobin was 82 per cent and the white blood count was 40,300. The red count was 4,180,000 and the color index 1. The differential count revealed the polymorphonuclears to be 45 per cent, eosinophils 31 per cent, basophils 4 per cent, lymphocytes 16 per cent and monocytes 5 per cent. Of the entire granulocytic series, 4 per cent were myeloblasts, 6 per cent myelocytes, 1 per cent metamyelocytes and 6 per cent band cells.

As to the slides that were shown, slide I shows two eosinophils. Most of the eosinophils noted in this blood slide were of the mature type. Slide II shows a myeloblast with its narrow zone of cytoplasm and a few azure granules. The nucleus presents the typical sieve-like appearance with two nucleoli. There is an early nucleated red cell in this slide. Slide III is another myeloblast or stem cell. Slide IV shows a myeloblast and a leucoblast. There is also a basophil and neutrophilic metamyelocyte present. Slide V shows a promyelocyte and a neutrophilic metamyelocyte. Slide VI shows a nucleated red cell, basophil, a neutrophilic metamyelocyte and a neutrophil. Slide VII shows four eosinophils.

In studying blood slides made in September and December 1939 we thought that we were dealing with a myelogenous leukemia and did not attach any particular significance to the eosinophilia. It was also Dr. Downey's opinion, in the blood picture of these slides, that we were dealing with a myelogenous leukemia.

DR. E. K. GEER: Apropos of Dr. Barron's remarks concerning a European report which dealt with eosinophilia in tuberculous patients, may I add that we must have a different brand of the disease in this part of the United States; one that doesn't stimulate eosinophil formation. I am sure Dr. Noble will bear me out in this statement at least as far as patients on the tuberculosis service of Ancker Hospital are concerned.

DR. LEPAK, in closing: I am very grateful for the generous discussion of this unusual condition. The reported case was intended to serve that purpose. So far as I am concerned, the case remains doubtful since we did not have a postmortem examination. Every one can think, therefore, as he pleases about its exact nature.

DR. BARRON: How large was the spleen? How much do you think it might have weighed? And how large was the liver?

DR. LEPAK: The spleen extended down below the left iliac crest and might have weighed about 2,000 grams. The liver was found to extend about one inch below the umbilical line.

HOURL-GLOSS-SHAPED MENINGIOMA INVOLVING MEDULLA, FORAMEN MAGNUM AND CERVICAL REGION

GEORGE N. RUHBERG, M.D.,

Saint Paul, Minnesota

Hour-glass tumors although not rare are of sufficient infrequency that in many situations unless one has been conditioned to them by clinical experience or met them at the autopsy table their possibility is often overlooked.

They arise from the membranes, nerves, and ganglions of the spinal cord, from the sympathetic nervous system, from the ligaments in or about the verte-

bræ, from the cartilage of the auricular surfaces of the vertebrae and ribs and rarely from the epidural fat. The larger number have arisen from the membranes, nerves, and ganglions of the cord.

Their method of growth may be as follows:

1. Arising within the spine, growing outward and extending through an intervertebral foramen and enlarging again in the paravertebral structures.

2. Arising without the spine and progressing into the spinal space and enlarging.

3. Arising within the intervertebral foramina and growing in both directions.

4. According to Coenen these tumors take a passive and not an active part in determining their shape. They are present as tumors, possibly as spherical tumors, before the development of the skeleton, whose development impinges upon them and give them their shape.

The case presented tonight is that of a meningioma assuming an hour-glass-shape by springing from the medulla, passing through the foramen magnum and presenting as a mass in the posterior cervical region.

E. D. L., a colored boy of four years, was admitted to the Children's Hospital, Saint Paul, on January 1, 1940, because of stiff neck, pain in the neck on movements of the head, tilting of the head and a mass in the posterior cervical region. Present illness as stated by patient's uncle began two years ago after falling down stairs. Since that time he has carried his head turned to one side.

On physical examination, he was well developed and fairly well nourished, and in no acute distress or pain. Temperature was 100 2/5 rectally and varied from 99 to 100 degrees during hospitalization. He held his head tipped forward and rotated to the right side in a fixed position. On attempting to move his head from side to side he would turn his whole body. He cried when an attempt was made to passively turn, flex or extend the head. The cranial nerves and eye grounds were negative. There was some exudate in the nose. The throat was slightly injected. There was a large "cervical gland" on the right side behind the ear. This was hard and fixed. The lungs were clear. The heart was normal. The abdomen was essentially negative. The extremities showed normal reflexes. Movements of his head caused pain.

Laboratory studies of urine and blood were essentially negative. Wassermann and Mantoux tests were negative. Roentgenogram of the cervical spine was essentially negative. The chest showed moderate pulmonary congestion and bronchitis. The mastoids were negative. No definite diagnosis was made.

On January 27, 1940, a neurological examination by the writer revealed objective findings as follows:

1. Head held tilted forward and to the right.
2. Stiff neck and painful reactions on attempted movements of head.
3. Loss of left upper extremity and diminished biceps reflex.

4. Sustained left ankle clonus and increased reflexes of left lower extremity.

5. Spinal fluid showed a cell count of 4 and total protein of 210 mg.

6. Sensory findings were not reliable on account of lack of coöperation of the patient.

A diagnosis of a central nervous system involvement of the upper cervical region was made and a biopsy recommended of the "cervical gland." On account of the rapid decline in the patient's physical condition this was not carried out. Paralysis spread to both arms and left leg by January 30 and he died February 1, 1940.

Necropsy findings were essentially unimportant with the exception of the findings relative to the lesion involving the neck and central nervous system.

A subcutaneous tumor mass resembling an enlarged lymph node was found in the posterior portion of the right neck just behind the ear. It measured 4 x 2.5 x 2 cm., and it was firmly attached to the border of the foramen magnum on the right side. On section, this tumor consisted of pale yellowish gray cellular tissue, which was soft and friable. Examination of the cortex was grossly negative. On lifting the cerebrum there was found a well encapsulated rounded slightly lobulated tumor measuring approximately 3 cm. in diameter and arising by a pedicle from the dura over the right anterior surface of the lower posterior portion of the medulla and completely occluding the foramen magnum and in so doing, displacing the medulla to the left and posteriorly and compressing it. On the right side this tumor infiltrated through the foramen and directly connected with the tumor in the neck. It consisted of soft, yellowish gray cellular tissue similar in character to that found in the neck tumor. A diagnosis was made of:

1. Meningioma of the medulla with extension into neck and compression myelitis of the medulla.

This case is an example of so-called hour-glass-or dumb-bell-shaped tumor of intracranial and cervical involvement, exhibiting the syndrome of tilting head and signs of compression myelitis described by Elsberg and others in cases of tumors involving the foramen magnum. Appreciation for the opportunity of examining this case is acknowledged to Dr. George Hagerman, on whose service the patient was, and to Dr. Kano Ikeda, who performed the autopsy and made the microscopical diagnosis.

Discussion

DR. J. F. NOBLE, Saint Paul: I have nothing special to add to the discussion of this case. I have never seen a meningioma in a child of this age. From the lantern slides it seems to me that a diagnosis of meningioma is justified, and, since that was Dr. Bell's diagnosis, I can see no reason for doubting it.

The meeting adjourned.

A. G. SCHULZE, M.D., *Secretary.*

Stated Meeting, Thursday, December 7, 1939

President, DR. WILLARD D. WHITE, in the Chair

Secretary, DR. HARVEY NELSON

GASTROJEJUNAL ULCER FOLLOWING GASTRO-ENTEROSTOMY PERFORMED TWENTY-FOUR YEARS BEFORE FOR PYLORIC STENOSIS OF INFANCY

L. HAYNES FOWLER, M.D.

and

WILLIAM A. HANSON, M.D.

Minneapolis

This patient was a young man twenty-four years of age. He consulted us in June, 1938, on account of recurring attacks of epigastric pain accompanied by hematemesis and melena. He stated that he had had a gastro-enterostomy performed on account of pyloric stenosis when he was six weeks of age, i.e., in 1914. He grew to young manhood and had no symptoms relative to his stomach until six years ago, when he was eighteen years old. For the past six years he has had intermittent attacks of epigastric pain which were at first relieved by food, soda and an ulcer diet but which recently have become almost constant and much more severe. During these six years he has been hospitalized three times on account of severe bleeding, for which he has had several blood transfusions.

Physical examination was essentially negative. He was a well developed and well nourished young man. The abdomen was slightly tender to the left and above the umbilicus. Examination of his blood showed a moderate degree of secondary anemia.

X-ray examination of the stomach showed a large well-functioning gastro-enterostomy with a large area of ulceration on the jejunal edge of the stoma. Some of the barium could be forced through the pylorus.

A diagnosis of gastrojejunal ulcer was made and surgical treatment advised.

Operation was performed June 23, 1938, at Northwestern Hospital, under a general anesthetic. On opening the abdomen, a large opening from a posterior gastro-enterostomy was found. The pyloric outlet seemed smaller than normal, barely admitting the tip of the index finger. The stomach and duodenum were otherwise normal. The transverse mesocolon was dissected free from the posterior wall of the stomach, and the gastro-enterostomy taken down. There was a large necrotic ulcerated area on the proximal jejunal side of the stoma. This was excised, and the two large openings in the stomach and jejunum measuring four inches long were closed separately with two rows of chromic catgut reinforced with silk. A pyloroplasty was then done by making a longitudinal incision one and one-half inches long through the full thickness of the duodenum, pyloric muscle and stomach, and then suturing the same in a vertical direction, thus enlarging the outlet of the stomach. The abdomen was closed without drainage. The immediate postoperative condition was good. Continuous nasal suction was employed for four days. On removing the tube, the patient became very uncomfortable, the upper abdomen became distended and on reinserting the tube, 1500 c.c. of gastric retention was removed. After twelve days of temporizing, we felt satisfied there was complete obstruction, either at the pylorus or in the upper jejunum. The abdomen was re-opened. We found the pylorus in good condition. The loops of jejunum at and near the portion which had been detached from the stomach formed a mass of

distended, red, obstructed bowel, adherent in a rent in the transverse mesocolon. We first attempted to free these distended loops but found this impossible. We then made an entero-anastomosis between the jejunum distal to the obstruction and the duodeno-jejunal angle. On account of the limited space, this was done without clamps. A number 14 French catheter was inserted into the jejunum distal to the anastomosis for feeding. Following this second operation, he still continued to have considerable gastric retention. Fluid injected into the jejunostomy tube was recovered from the stomach and vice versa. A flat plate of the abdomen showed the catheter to have passed through the entero-anastomosis and extended into the transverse part of the duodenum. The catheter was removed. The gastric retention ceased, and the patient made a good recovery. A normal diet was gradually resumed, and on leaving the hospital on August 3, 1938, he was eating everything without discomfort.

An x-ray examination after the ingestion of a barium meal on November 11, 1938, showed a slight narrowing in the middle third of the stomach. The barium passed freely and rapidly into the jejunum, which had been obstructed, and also through the entero-anastomosis. Plates taken two and one-half hours later showed the stomach empty, the head of the column at the transverse colon and the tail in the lower ileum.

The patient has remained well and free from any gastric symptoms to date, which of course is only one and one-half years.

Comments

This case has several interesting features:

The first is that this six-weeks-old baby survived a gastro-enterostomy performed for pyloric stenosis. This operation was done in 1914 by a Saint Paul surgeon, name unknown, two years after Rammstedt first reported his well-known operation for pyloric stenosis.

Secondly, in a limited review of the literature we have been unable to find another reported case of a gastrojejunal ulcer forming in a gastro-enterostomy stoma performed for pyloric stenosis.

Third, the opening between the stomach and jejunum was unusually large (four inches long). Apparently the opening grew as the boy developed.

Fourth, as a result of the large stoma, there was very little tissue in the transverse mesocolon to close, which undoubtedly contributed to or caused, the postoperative obstruction.

Fifth, the essential surgical treatment consisted of disconnecting the gastro-enterostomy. It is well known that an ulcer of the stoma will heal if only this is done. Usually, gastrojejunal ulceration follows a surgical procedure done for the relief of a peptic ulcer. Such a situation ordinarily necessitates a partial gastrectomy in addition to taking down the gastro-enterostomy. In the case reported, we had no antecedent peptic ulcer. We therefore felt that a pyloroplasty was more indicated and performed the same. Time will tell whether or not our judgment was correct.

LEIOMYOSARCOMA OF THE ILEUM*

RALPH EMERSON WEIBLE, M.D.
Fargo, North Dakota

Mr. E. C. M., aged sixty-four, was a farmer weighing 200 pounds and had been well until his present complaint. He came to the hospital June 18, 1939, at 2 P. M., stating that he had fallen ill sixty-four hours previously with a severe chill and acute generalized abdominal pain. The pain subsided somewhat after a half hour and he did not go to bed. The persisting soreness seemed to him to be centered just below the umbilicus. He took no food. The day before admission he took a laxative and the bowels moved twice. At 8 P. M. he vomited. This was repeated at 3 A. M. Severe pain started again two hours before examination.

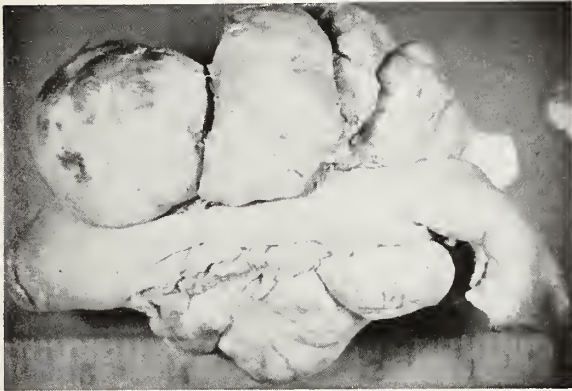


Fig. 1.

On examination the abdomen was distended and hard. No masses could be felt but it seemed he was more tender below the umbilicus. His blood pressure was 140/80, temperature 100, pulse 110. Three hundred c.c. of dark fluid were removed from his stomach. X-ray showed no free air under the diaphragm.

Under spinal anesthesia the abdomen was opened to the right of the midline. There was considerable dark, foul smelling fluid. No lesion was found in the epigastrium. A large tumor of the ileum situated below the umbilicus was brought into the wound. There was a perforated, gangrenous area in the tumor. The intestine and tumor were excised and an anastomosis of the bowel done. Fluid was aspirated and the wound closed with a drain. The patient, after a succession of complications from peritonitis, died three weeks after operation.

Leiomyosarcoma of the small intestine may be truly malignant or very mildly malignant in character. The truly malignant type are relatively small, seem to grow from the inner muscular layers, and tend to grow into the lumen of the bowel.

The mildly malignant type are large tumors projecting out from the bowel. It would seem that they grow from the outer longitudinal muscle. If operated upon before perforation occurs, the outlook is good.

A few case reports from the literature were abstracted and the subject discussed.

*From the Dakota Clinic.

CONGENITAL CYSTS AND FISTULÆ OF THE NECK

ARNOLD SCHWYZER, M.D.
Saint Paul, Minnesota

A most interesting and instructive description of branchial cleft or lateral neck cysts and fistulas and thyroglossal cysts and fistulas was given by Dr. Arnold Schwyzer of St. Paul by invitation. A very complete description of the embryology, diagnosis and treatment of these conditions was given in Dr. Schwyzer's usual thoroughness and detail. Numerous illustrative slides were presented.

Discussion

DR. MARTIN NORDLAND: It has been very pleasant and enlightening to listen to Dr. Schwyzer. He has been called upon often by Minneapolis medical societies and he always has brought something of interest and value to us. His splendid and complete presentation of this subject tonight has demonstrated how important it is to have a thorough understanding of the embryological development and the anatomy of the neck in order that one may properly diagnose and treat these lesions. Most of us have encountered cases of this nature in which the proper diagnosis was not made and as a result of this, inadequate treatment was rendered.

Dr. Schwyzer did not comment on the incidence of congenital cysts and fistulæ of the neck. In a recent article from the Lahey Clinic published in the *A.M.A. Journal*, it was reported that only .05 per cent of the total number of registrations at that clinic in a period of fifteen years from 1921 to 1936 were so classified. From the Jackson Clinic at Madison, Wisconsin, Dr. Arnold Jackson recently reported thirteen cases of lateral branchiogenic cysts encountered over a period of ten years. Cattel in a recent discussion of this subject, called attention to the infrequency of the occurrence of thyroglossal duct anomalies, by the statement that they are found to exist at a ratio of 1 to 90 as compared to thyroidectomies.

It is obvious therefore, that while the occurrence of these lesions is not rare, nevertheless, it is evident that they are encountered so seldom in the experience of the average surgeon that they are not always recognized. As a result, the proper treatment is not always administered.

It is readily seen from Dr. Schwyzer's description of these lesions that the surgical treatment must be carefully planned and executed. While it may be considered elementary, still I think it is worthy of attention that the patient should be carefully placed in good position before the operation is started. Dissection of fistulous tracts and the removal of adherent scars can then be better accomplished without accident. I was very happy to hear Dr. Schwyzer call attention to, and recommend a transverse incision. Incisions along the anterior border of the sterno-mastoid always leave ugly scars. They were abandoned years ago in the surgery of the thyroid and should never be used in any surgery of the neck. Excellent and adequate exposure for the removal of congenital cysts and fistulæ of the neck is obtained through the transverse incision.

DR. E. T. BELL: These tumors are interesting chiefly because of their rarity. This tumor is of low malignancy, barely coming into the group of sarcomas. I think the diagnosis is justified here because of the mitoses and because the tumor was steadily getting larger. The leiomyomas in the intestine as well as those

in the stomach and other situations seldom form metastases. I have only one record of a metastasizing leiomyosarcoma.

It is of interest that the myomas of the uterus which are histologically malignant, are clinically benign. We have uterine myomas with four or five mitoses per high powered field, which were cured by hysterectomy or even by myomectomy. Some of the five-year cures look very malignant histologically. In the uterus the diagnosis of leiomyosarcoma doesn't seem to carry an unfavorable prognosis with it and it doesn't demand any treatment other than what you give to a simple benign myoma.

The myomas of the stomach are of interest. I have seen two very large intraluminal myomas of the stomach. One of these had a rather interesting history. A little over ten years before the patient died, he sustained a very severe burn. Some months later he developed gastric symptoms and a diagnosis of carcinoma of the stomach was made. That diagnosis was confirmed by the best men around town; roentgenologists, as well as surgeons thought it was carcinoma of the stomach. It was maintained that the burn caused an ulcer and that the ulcer developed into a carcinoma. The man was paid compensation but he refused to die of the carcinoma—in fact, he lived for ten years. Ten years after he was awarded the compensation, he died from a perforation of the stomach. The myoma filled the stomach completely and was of enormous size. There was just a little rim of space left in the stomach around the tumor. The tumor extended the whole length of the stomach and had caused an ulceration through the wall. The pressure on the stomach caused a perforation with peritonitis.

The other case of intraluminal myoma of the stomach also ended in perforation after several years. Extraluminal tumors are quite another matter. In the stomach they produce large masses that push the stomach from the outside and one can readily recognize that there is a tumor outside the stomach.

DR. O. J. CAMPBELL: A few years ago I had an experience with such a case which indicated that it might be difficult for the pathologist to differentiate between a benign leiomyoma and a leiomyosarcoma. This patient was an elderly man, a little past middle age. He came in with an acute abdomen. He had a tender mass in the left upper quadrant. I do not recall what our diagnosis was but needless to say, we were not accurate in our diagnosis. We went in and found and resected a leiomyoma about five inches in diameter, in the very first portion of the jejunum. It had not perforated but was covered by fiber and there was a localized peritonitis around it. I found no evidence of metastases. We resected the tumor mass. The man made an uneventful convalescence. Dr. McCartney, pathologist at Abbott Hospital, studied the tumor and thought it was probably a benign tumor and diagnosed it a leiomyoma. Approximately three years later, this man returned with a large mass in his right upper quadrant. There were no inflammatory elements about it. We watched it for a while and decided the only thing we could do was to do an exploration biopsy to see if there was anything that might help. We did this and found a tumor mass about the size of the patient's head adherent to the under surface of the liver. I found no other tumor masses in the abdomen nor the liver. A section of this was taken and was found to be hemorrhagic and necrotic. Dr. McCartney studied it and made a diagnosis of sarcoma. So the tumor we had operated on and diagnosed a leiomyoma should properly have been diagnosed a leiomyosarcoma.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

MODERN DERMATOLOGY AND SYPHILOLOGY. S. William Becker, M.D., Associate Professor of Dermatology and Syphilology, Kuppenheimer Foundation, University of Chicago; and Maximilian E. Obermayer, M.D., Assistant Professor of Dermatology and Syphilology, Kuppenheimer Foundation. 871 pages. Illus. Price, \$12.00, cloth. Philadelphia: J. B. Lippincott Co., 1940.

CLINICAL DIABETES MELLITUS AND HYPERINSULINISM. Russel M. Wilder, M.D., Ph.D., F.A.C.P. Professor and Chief of Department of Medicine, Mayo Foundation for Medical Education and Research, University of Medicine; Head of Section on Metabolism Therapy, Mayo Clinic, Rochester. 459 pages. Illus. Price, \$6.00, cloth. Philadelphia: W. B. Saunders Co., 1940.

DIRECTORY OF MEDICAL SPECIALISTS. Certified by American Boards, 1939. Paul Titus, M.D., Directing Editor. 1573 pages. Price, \$5.00, buckram binding. New York: Columbia University Press, 1940.

THE RELATIVITY OF REALITY. René Laforge, M.D. Translated by Anne Jouard. 92 pages. Price, \$2.50, stiff board cover. New York: Nervous and Mental Disease Publishing Co., 1940.

DISEASES OF THE DIGESTIVE SYSTEM. A Text-book for Students and Practitioners. Eugene Rosenthal, M.D., Lecturer in Medical Faculty, Royal Peter Pazmany University, Budapest. Preface by R. J. V. Pulvertaft, M.D., F.R.C.P. Reader in Pathology. University of London: Director of John Burford Carhill Laboratories and Curator of Museum, Westminster Hospital School of Medicine. 394 pages. Illus. Price, \$8.50, cloth. St. Louis: C. V. Mosby Co., 1940.

THE BACTERIOLOGY OF PUBLIC HEALTH. George M. Cameron, Ph.D., Associate Professor of Bacteriology, University of Tennessee. 451 pages. Illus. Price \$3.50, cloth. St. Louis: C. V. Mosby Co., 1940.

CANCER OF THE COLON AND RECTUM, ITS DIAGNOSIS AND TREATMENT. Fred W. Rankin and A. Stephen Graham. 358 pages, 210 illustrations in 133 figures, 54 tables. Price \$5.50. Springfield, Illinois: Charles C. Thomas, 1939.

This volume is the most complete review of the subject of colonic malignancy published to date. While the whole tone of the book is authoritative, it is in the chapters dealing with "Choice of Operations and Operative Mortality and End-Results," that the authors are at their best. An operative mortality of 7.5 per cent for combined abdomino-perineal resection for cancer of the rectum and rectosigmoid is an achievement. However, it will be interesting to note if there will be any difference in the number of five-year survivals following abdomino-perineal resection and posterior excision for carcinoma of the rectum below the peritoneal reflection. For the surgeon who only occasionally operates upon such patients, colostomy followed by posterior excision is certainly the safer operation and would seem to be the procedure of choice.

Some may not agree with the statement that hernia-

tion is prone to occur after transverse colostomy (page 268); others may not believe that there is such a close correlation between histologic grading of colonic tumors and prognosis. However, the general excellence of the book overshadows any of these minor differences of opinion. The volume is strongly recommended for all interested in the subject of colonic malignancy.

—CHARLES E. REA, M.D.

THE MEDICAL CAREERS. Harry Cushing, M.D., Boston: Little, Brown and Co., 1940. An Atlantic Monthly Press publication.

In this volume is assembled a number of addresses and biographies, which have appeared in print elsewhere. The idea apparently is to publish these heretofore scattered products of the pen of a great surgeon in a single volume accessible to those who appreciate greatness, for Harry Cushing was not only a leading surgeon of his time but a fine character and an able writer. The material was selected for publication by the author and the editor of the *Atlantic Monthly Press* last summer, not long before Dr. Cushing's death. One would expect that the volume would be read with interest by all medical men, the younger ones particularly.

C. B. DRAKE.

OPERATIVE ORTHOPEDICS. Willis C. Campbell. 1154 pages. Illus. \$12.50. St. Louis; C. V. Mosby Co., 1939.

This book offers an exhaustive description of procedures used in orthopedic surgery. It is well illustrated. Perhaps the only criticism one could offer would be the lack of critical analysis of the results of many of the operations here represented.—S.W.S.

CANCER HANDBOOK OF THE TUMOR CLINIC
—Stanford University School of Medicine. Edited by Erick Liljencrantz, M.D. 114 Pages with fifty figures. Price \$3.00. Stanford University, California: Stanford University Press, 1939.

This manual is a syllabus on the diagnosis and treatment of malignant tumors, assembled for postgraduate instruction at the Stanford University School of Medicine. In the first chapter, the cancer problem is stated simply, yet comprehensively. Diagnosis, treatment, and prognosis of the more frequent tumors are discussed. The diagrams are excellent, but the photographs of the lesions would be more effective if they were in color. The bibliography of the more pertinent literature is appended. The index is workable and fairly complete. This volume is one of the best handbooks on the cancer problem published to date.

—CHARLES E. REA, M.D.

STANDARDS FOR THE DIAGNOSIS AND TREATMENT OF CANCER. Cancer Manual developed by the Executive Cancer Committee of the Iowa State Medical Society. 168 pages. Price \$1.00. Iowa City Iowa: Atheas Press, 1938.

The Iowa State Medical Society is to be congratulated on the publication of this splendid manual. It is almost incredible that so much regarding the symptomatology, diagnosis, and treatment of the more common

tumors could be presented in this small volume. One may wonder if the authors are not a bit optimistic regarding the prognosis of cancer of the tongue (page 30). However, as a whole, the book is conservative, up-to-date, and practical. This manual could be read with profit not only by general practitioners, but also by all interested in the cancer problem.

—CHARLES E. REA, M.D.

ESSENTIALS OF THE DIAGNOSTIC EXAMINATION. John B. Youmans, M.D., B.A., M.S., Associate Professor of New York: Commonwealth Fund, 1940. Price, \$3.00.

The book "Essentials of the Diagnostic Examination" by John B. Youmans, M.D., should prove a valuable addition to the library of the clinician. Physicians are always eager and thirsty for information that might help in diagnosis.

This compact book is divided into three parts. The first portion is concerned with the clinical history. The author in his introduction states quite clearly "The importance of the history or anamnesis can scarcely be overemphasized though, as stated in the introduction, no part of the diagnostic examination can be said to be more important than another. The reason for stressing the importance of the history is that it is so frequently neglected." This appeal in history taking should stir the practitioner who may feel that being pressed by time he finds it difficult to carry out this important procedure.

Also in part one of the book, Dr. Youmans discusses the physical examination, but the space devoted to this subject is limited. One finds many of the essentials hurriedly covered and inadequately described. The author has many references, however, to more complete works on this subject. On page 122 the author refers to a saying that "A medical specialist differs from a non-specialist in that he looks at the eye grounds and examines the rectum." This should, indeed be a challenge for more general practitioners to use the methods of specialists, and for more specialists to be specialists.

The section on the neurological examination should prove especially appealing to the general practitioner, the internist, and the surgeon alike. This section is opened by the statement that "Many physicians have a feeling of inadequacy with respect to neurology and neurological diseases. This is altogether unnecessary." With this challenge, Dr. Youmans goes on to lay down a sensible, practical, and clear method for the examination of the cranial nerves, reflexes, sensation and the mental state. The particular section should encourage the physician who altogether too frequently has regarded this portion of a physical examination as something obscure, and beyond his capabilities. Dr. Youmans' plea in this connection should not go unheeded.

In the second part the doctor discusses laboratory tests that are essential and commonly used. This section is well illustrated and the procedures are simply and very adequately described. The description of laboratory procedures is indeed timely in that the tests

for sulfanilamide and sulfapyridine blood determinations are well outlined. The doctor in practice who does his own laboratory work should be refreshed by this section.

There is nothing particularly new in this book. As the cover flap states, "This handbook sets forth procedures of the diagnostic examination that are essential to all good medical practice." The hand book follows the usual orthodox clinical and scientific plan and should be helpful in the performance of the important history taking, complete physical examination, and pertinent laboratory procedures. The hand book is adequately illustrated and indexed, and has numerous diagnostic charts that should be of help.

—SIMON G. SAX, M.D.

AN INTRODUCTION TO GASTRO-ENTEROLOGY (The Third Edition of *The Mechanics of the Digestive Tract*). By Walter C. Alvarez, New York, Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers. 778 pp. Price \$10.00.

To those who so thoroughly enjoyed the first two editions of *The Mechanics of the Digestive Tract*, this new volume should provide many evenings of delightful and thought-producing reading. In addition it is a veritable encyclopedia of fundamental and historic contributions to the physiology of the digestive tract, containing a bibliography of around 2,500 titles. This bibliography alone is worth the price of the volume, as a reference source.

The first few chapters describe the various types of motor functions of the small bowel and particularly the polarity of the bowel which waves travel more easily caudad than orad. The author and others have shown that there is a downward gradation in activity, tonus, irritability and rate of rhythmic contraction along the small bowel from the duodenum to the ileocecal sphincter (the "gradient theory"). These gradients constitute the best approach to the study of the polarity of the bowel. Other gradients have also been demonstrated, such as those of oxygen consumption and catalase content, blood supply, propulsive force, and pH of intestinal contents in many animals. Many factors tend to reverse or steepen these gradients. Flattened or reversed gradients are found in sick animals and in pregnant women, from emetics, or with rectal irritation even from use of a Murphy drip. Steepened gradients may be found from certain cathartics or from increased tonus in the upper end of the bowel due to ingestion of food. Bayliss and Starling's old "law of the intestine" is challenged, and the author proposes a new "law of the intestine" to the effect that any stimulus which raises the tonus, activity and irritability of a segment of bowel tends to slow the progress of waves and material approaching the segment on the oral side and to hurry the progress of material leaving on the caudal side. Reverse peristalsis may be a manifestation of an altered gradient in some segment of the bowel, and results in symptoms such as nausea, heartburn and bloating.

The next few chapters consider the structure of the

smooth muscle and its nerve plexuses and their relationship to the extrinsic nerves of the digestive tract. The opinion is expressed that impulses from the extrinsic nerves are transmitted to smooth muscle of the bowel largely through chemical substances formed at the ends of the nerves. The rhythmic activity of the bowel is influenced by the extrinsic nerves yet its origin is in the bowel. The function of the myenteric plexus is to expedite conduction and to correlate activities of the muscle fibres. The ganglion cells of the plexus probably function to prevent the muscle contracting into a knot and remaining that way (as in cardiospasm, and Hirschsprung's disease). The effects of extrinsic nerve stimulation are not constant—they vary with the strength of stimulus, rate of interruption, and the level of tonus of the muscle at the moment. Afferent stimuli reach the brain and may harm the animal. Thus an animal with an obstructed overly active jejunum will live longer if the obstructed segments are denervated. The author discounts the old theory of a conflict between vagus and sympathetic—they both act to restrain excessive activity of the bowel. The vagus nerves have more to do with functions of the stomach and the splanchnics more with the bowel. Both, however, influence all parts of the small intestine. The vagus reaches only the proximal half of the colon. The quieting of the bowel seen in peritonitis is largely due to nervous inhibition, being much less marked in animals previously subjected to splanchnicotomy.

The cardia, pylorus and its control, and movements of the stomach are discussed in the next four chapters. There is no specialized cardiac sphincter in man, but only a variable amount of sphincteric action at the cardia. Such a sphincter is not needed in upright animals but is very pronounced in animals hanging upside down. The vagus and sympathetic nerves have varying effects on the cardiac end of the stomach depending largely on its tonus at the time of stimulation. Cardiospasm may often be due to separation of the muscle from its ganglion cells. Gastric contraction waves usually seen beginning near the middle of the stomach arise as ripples at or near the cardia, passing on down and resulting in a systole of the circular muscle of the antrum about three times each minute. More important for emptying the stomach are the slow tonic contractions of the whole muscular wall increasing the intragastric pressure. There is a mechanism present for adjusting the tonus of the gastric wall to the quantity of food taken. Indigestion arises if one eats too rapidly to allow this mechanism to function. The stomach muscle also has a "gradient" of irritability and contractility, greatest at the cardia. The author emphasizes the almost complete separation of pyloric and duodenal muscles, lymphatics and blood vessels. Animals and man live comfortably after removal of the pylorus for gastric emptying still is chiefly regulated from the bowel. One must remember that gastric waves do not push fluids through the pylorus. Many waves cause no emptying at all of the stomach. Only with increased intragastric pressure or relaxation of the duodenum does the stomach empty. The presence of food or liquid in the duodenum, regardless of

its acidity, retards gastric emptying. Likewise distention or irritation of the lower small bowel may delay gastric emptying. Fat in the bowel slows gastric emptying. Hydrochloric or other acids in the duodenum slow gastric evacuation by increasing intraduodenal tension. Alvarez sums up the controversy over the acid-control of the pylorus by calling acid control of the pylorus unimportant, since any substance, acid or alkaline, which increases the tonus of the gastric muscle and thereby the pressure within its cavity, must tend to speed up emptying. Any substance so acid or alkaline as to irritate the duodenal mucosa will be held back in the stomach until diluted or neutralized. In addition, the pylorus acts as a small funnel passing liquids but not solids larger than its bore. Duodenal contents regurgitate into the stomach if intraduodenal pressure is increased over that in the stomach. Fear, anxiety, pain or anger often slow gastric emptying for hours. The latter is speeded by lying on the right side or by exercise after a meal.

Two chapters are devoted to the movements of a diseased stomach and to the question of ulcer pain and hunger contractions. Most evidence points to the cause of ulcer distress as being irritation by the hydrochloric acid of the gastric juice rather than merely the contraction of the muscle overlying the ulcer. One problem yet unsolved is why some patients may lose all ulcer distress on the morning of the first day of their vacation. The author mentions the damage done to an ulcer during the night hours, and suggests the value of night neutralization of acid in the stomach. A

periodic increase in the sensitiveness of the stomach or nervous system is important in explaining why ulcer pain appears at certain times. An ulcer anywhere in the stomach or duodenum may cause a hypertonic pars pylorica and thus delay gastric emptying.

The final third of the book is devoted to an unrelated group of subjects, such as vomiting, mechanics of the gallbladder, the appendix, movements of the colon, the length of the bowel under varying conditions, constipation etc.

Vomiting and diarrhea may often be associated due to emptying of the small bowel both ways from some midpoint which may be stimulated through the vagus nerves. The author emphasizes the fact that since the small bowel is more sensitive than the stomach to the nauseating effect of irritant drugs, putting such drugs in keratin or salol coating is irrational.

Present-day evidence is that emptying of the gallbladder is under the control more of a hormonal than a nervous mechanism. Decided slowing of emptying is seen after the third month of pregnancy. In emotional persons a temper tantrum may initiate an attack of gallstone colic. Colic seen in the absence of gallstones may be due to biliary dyskinesia or to failure of the sphincter of Oddi to relax with contraction of the gallbladder.

The ileocecal sphincter is not essential to good health—a simple anastomosis between ileum and colon is as satisfactory. Putting food into the stomach causes a hurrying of the residue from the ileum into the colon. Alvarez concludes that there is no pathognomonic

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, *AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES*, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

roentgenologic sign of chronic appendicitis. No correlation can be established between the x-ray findings on a supposed chronic appendix and the pathologists report on it after removal, for almost all appendices show slight evidence of past infection. The final test of the value of removal of a chronic appendix is to wait over a year to see if the operation cured the patient's symptoms. Improvement noted soon after surgery in these cases is often transient.

One of the main purposes of the colon is to conserve the water supply of the body. Constipation often is due to too great efficiency of the colon in removal of water from the bowel. Constipation is decidedly a disease of nervous origin—of civilization with its hurry, strain and tension. It may often be caused by too little food or too little residue in the food used. The results of stimulation of the colonic extrinsic nerves has not yielded clear-cut results. Children with megacolon usually are benefited by section of the nerves belonging to the lumbar sympathetic outflow.

The bowel in herbivorous animals is always much longer than that found in carnivorous animals. A rough indigestible diet will increase the length of the bowel in experimental animals and probably in man. In a living man the distance from mouth to anus is about 2.5 meters. In death this distance is two or three times as great.

It must be realized that a barium meal is not physiological. It passes through the bowel much faster than does most food. In normal young people colored glass beads require several days to a week for their passage through the digestive tract. The taking of much water washes food rapidly through the small bowel. This is often undesirable and results in indigestion and insomnia, and often diarrhea. Frequent feedings speed passage through the small bowel. Each new feeding gives a forward push to the residues of the preceding meal. Milk gives a bulky residue in the lower ileum and colon. Foods giving the least residue are lean meat, rice, hard boiled eggs and sugar.

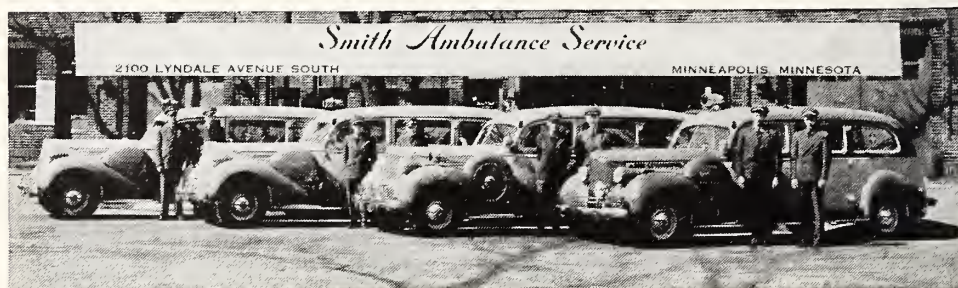
Gas in the bowel consists largely of nitrogen remaining from swallowed air. In intestinal obstruction the gas also consists largely of nitrogen. Carbon dioxide leaves the bowel by diffusion most easily of all the gases found there. Oxygen is next and nitrogen is the slowest to diffuse into the blood. Breathing pure oxygen lowers the nitrogen tension in the blood and thus the nitrogen in the bowel may be taken up by the blood more easily. There is no gas produced in the stomach by fermentation, as is the case in the right half of the colon. Heart disease, allergy and protozoan parasites are all important causes of flatulence. "Gas pains" after operation are rarely due to gas.

The hunger complex is still not entirely clear. It is not due entirely to contractions in the stomach or intestine, or to a lowered blood sugar.

In doing a gastro-enterostomy it is not essential that peristaltic waves travel in the same direction in the stomach and the attached loop of bowel. Closure of the pylorus is apt to decrease the stimulus in the duodenum to the flow of bile and pancreatic juice and thus impair digestion. An entero-enterostomy increases the incidence of postoperative jejunal ulcer by removing much of the protective action of alkaline duodenal juices from the new stoma.

Two valuable chapters bring this book to its conclusion: one describing various technical methods and apparatus, and one containing advice to a young physician on his choice of books and reading. These are followed by the tremendous bibliography used in connection with the writing of this volume. This last chapter is characteristic of the charming and human personality of the author. Those who have heard Dr. Alvarez deliver a lecture will never want to miss an opportunity to hear him again. For those who cannot hear him, this book will provide a fund of information and an insight into the mind and personality of one of the greatest physiologists and clinicians of our time.

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PREVENTION AND TREATMENT OF GENITAL PROLAPSE*

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PROLAPSE is the falling downward or outward of a structure or organ, toward, into or through a natural or an artificial orifice. The term applies to specific structures only when a descriptive adjective or phrase modifies it.

The term Genital Prolapse as used in this discussion means a downward or outward displacement of all or of any portion of the female genital structures.

Inasmuch as such environmental structures as the urethra, bladder and rectum are so intimately associated with these genital organs, it is almost impossible not to have them involved in the process. It should be clearly understood then that there really is no such condition as an exclusively genital prolapse. Even as slight an involvement as a descent of the anterior or posterior vaginal wall implies some prolapse of the urethra or rectum.

The two major etiologic mechanical factors are those opposing forces of support and of pressure. Any disturbance of the equilibrium of these forces resulting in a relative excess of pressure over support will tend ultimately to cause a sagging of the tissues to a greater or a lesser degree.

The essential methods of prevention are those which eliminate the causes of inadequate support and of excessive pressure. The procedures for cure are the establishment and maintenance of a proper balance between support and counter-pressure. It must be remembered that neither the support nor the pressure is rigid or constant but both are elastic and variable. There are complicated factors in the application of the force and

of the resistance as they are both direct and indirect and may be shear or not. There are contributing factors which tend to alter the balance by increasing the pressure, by decreasing the resistance or by altering the mechanics of their application. The major factor seems to be associated with the processes of childbearing as these genital relaxations and descents are seldom seen in those women who have born no children. Occasionally even marked degrees of prolapse are found in nulliparous women but such cases are exceptions to the rule which prove that trauma to the supporting structures is not the sole factor to be considered in the etiology of these conditions. The forces which tend to cause a prolapse are twofold, the downward pressure from above by the intra-abdominal and intra-pelvic pressure and the pull or traction from below on the pelvic structures by the force of gravity.

The supporting or resisting forces are those of balance, which tend to hold the organs and structures in poise, by acting like guys on a derrick. These are the so-called ligaments of the uterus. While the cardinal ligaments may afford a measure of support they may be regarded as the swivel upon which the uterus swings. The real support comes from the endopelvic fascia or the urogenital diaphragm and from the pelvic floor which in turn is supported by the fibro-fat pads of the ischio-rectal fossæ resting upon the powerful glutei maximi muscles. It has been mentioned that there are the forces of pressure and pull which are constantly present but are nevertheless variable in degree and in direction of application. The results vary not only because of these factors but also because of the altered relationship to the forces of resistance. The degree of the force

*From the Department of Obstetrics and Gynecology, The University of Chicago and The Chicago Lying-in Hospital. Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

of gravity cannot be altered except in accordance with the universal laws. The direction of pull could be modified by the posture of the woman, and if the erect position were not essential there would be no syndrome of genital prolapse. The effect of gravity is also modified by its relation to supporting or resisting forces as the direct pull is more effective than a shearing one. The former is seen where the inclination of the pelvic floor is destroyed by a perineal laceration and the structures are drawn downward through the vertical and widened genital canal. Less frequently one sees a prolapse where the normal inclination of the vaginal canal is preserved.

The effect of the force of gravity can be illustrated very simply by having a woman who suffers a prolapse alternately assume the standing and the recumbent position. The prolapse is obvious in the former posture and tends to disappear in the latter. Cases can arise in which the diagnosis of prolapse is missed on examination of the patient in the dorsal position. Atmospheric pressure also has to be considered. In the erect position it operates mostly through the abdominal walls, but if a woman is placed in the latero-prone, or better, in the knee-chest position with the posterior vaginal wall retracted, the effect on the normal or sagging genital structures can be easily demonstrated.

Intra-abdominal and intra-pelvic pressure is the composite result of many components, the chief of which are the external atmospheric pressure, which has already been mentioned, the action of the diaphragm, and the condition and physiology of the abdominal walls. The posture and attitude of the body has much to do with the relation between intra-abdominal and intra-pelvic pressure. In other words, the effect of the force of intra-abdominal pressure is altered by body posture.

It is apparent that certain components of intra-abdominal pressure cannot be eliminated. Atmospheric pressure is fairly constant. The muscular effort necessary to control and maintain the bodily movement and posture cannot be eradicated. Respiratory movements cannot be suspended. The physiologic activity of the abdominal muscles necessary to defecation and urination cannot be avoided. The major factor which can be controlled is that of voluntary effort or physical activity. Any severe strain or muscular effort of the abdominal wall tends to increase pressure within the abdomen. The effect of this pressure

on the pelvic structures varies with the inclination of the pelvic brim and the position and the condition of the organs and structures within the pelvis. If the posture of the body is such that the brim of the true pelvis is more nearly horizontal then the pressure is more direct while the direction is more shearing when it has its normal inclination. If the uterus lies in retroversion because of a full bladder or other reasons the pressure is so exerted as to tend to push the uterus downward along the vaginal axis. If, on the other hand, the uterus lies in its normal position of anteversion the pressure tends to push the uterus forward and downward closing the utero-vaginal hinge.

Opposed to this force we have the adequacy of the structures surrounding the hiatus urogenitalis. This adequacy depends upon the size and direction of the hiatus and canal and upon the resistant and functional competency of the sustentacular pelvic structures.

The opening may be congenitally large or be stretched by parturition. The supporting structures may be weak from either congenital or acquired conditions. Among the most essential of these structures are the cardinal uterine ligaments which suspend the uterus near its isthmus and serve as a pivot upon which it turns. Another important component of the resistant and balancing forces is the endopelvic shelf upon which the uterus and bladder rest for support and beneath which the anterior vaginal wall runs downward and forward.

The posterior vaginal wall, passing along the thin partition of prerectal fascia, parallels the anterior vaginal wall and derives its support from the perineal and levator ani muscles and fascia which rest upon the ischio-rectal pads protecting the rectum and resting as supporting cushions upon the powerful gluteal muscles. The laxity or weakness of musculo-fascial supports both above and below has a contributory effect in the production of prolapsed organs. It is easier to pour the contents out of the aperture in an inverted collapsible sack or bag than from a more rigid container as a jug or keg. The firmer and stronger the abdominal walls the greater their sustaining power on the abdominal and pelvic contents. This may be compared to the lifting or holding power obtained by a vacuum bottle or sucker. This restraining force from above is diminished if the aperture is larger or its periphery is weaker. One has to consider also

the relation between the pressure from above and the support from below because, if the former is disproportionately greater, prolapse is more apt to occur than if the latter is relatively stronger.

This rather brief discussion of some of the component etiologic and mechanical factors involved in the production of genital prolapse shows that they are manifold in degree and direction and in relative intensity of pressure and resistance. There must be as a rule certain lack of synchronization, and a persistence in the operation of these forces as the development of genital prolapse is not a sudden but a gradual process.

There is a coordinating factor which must be considered as important—when the abdominal muscles and diaphragm are thrown into action, whether voluntary or involuntary, physiologic or pathologic, there should be an equivalent timed response from the supporting structures lying below. If this were not true the pelvic structures would be forced downward. Under normal conditions this action may be compared to that of a hinge. The uterus swings forward and downward on its pivotal cardinal ligaments and acts as one leaf of the hinge. The other leaf is supplied by the levator ani and perineal muscles which tend to shut the hinge and close the opening of the lower genital canal. The resistance must be sufficient in degree and appropriate in timing to prevent the descent of the pelvic structures. It is also important that all the pelvic structures have sufficiently normal relations and be in condition to permit the physiologic operation of all these opposing but coordinated forces. Any situation which disturbs the physiologic behavior of these forces and tends to make the pressure overcome the resistance either in degree or in direction may cause a prolapse of genital structures or organs.

Prolapse is not a simple but a complex condition; it is not uniform but multiform in its manifestations. One structure or many structures may be involved, and it may be of a slight or of an extreme degree.

It is important to bear in mind that it is not a stationary but a progressive disorder because once the supporting structures are weakened and those of pressure overbalance the former the tissues and structures are gradually pushed to a lower and lower level. This is certain to occur unless something is done either to improve or supplement the support or to lessen the pressure. The former can be accomplished in various ways.

The latter can be done only to a very limited degree as only pathologic pressure can be eliminated and certain essential physiologic pressure must remain. Prolapse of the rectum, urethra or bladder unassociated with genital prolapse will not be discussed in this presentation.

The simplest and most common form of genital relaxation involves the vaginal walls, usually the anterior or posterior or both. The lateral walls rarely sag unless the uterus descends. This sagging of the vaginal walls is referred to as colpocele, either anterior or posterior, and is caused by some atrophy or injury to the fascia and muscles supporting these structures. This is commonly caused by parturition as the result of pressure by the fetal head which injures these structures by stretching or tearing or by both. During labor the bearing down effort of the mother or the traction exerted during artificial delivery may pull down on these tissues so that the reparative or involutional processes never completely restore them. Even these lesser degrees of relaxation are uncommonly seen in nulligravida though some faulty development of the genito-urinary tissues with inherent weakness may result in even an extreme degree of prolapse. Excessive strain and hard physical work may overcome the natural resistance and produce a similar result. Occasionally, faulty innervation or other developmental defect associated with spina bifida occulta may be responsible for such a condition.

From the standpoint of the woman the most important point is whether or not any symptoms result from relaxation. These subjective signs may be urinary, gastro-intestinal, genital, pelvic or general and are not infrequently of an indefinite character.

Colpoceles rarely involve the vaginal walls alone as the rectum, urethra, and the bladder are so intimately and closely associated anatomically and physiologically that there is morphologic, if not functional, evidence of their implication.

When there are no symptoms, the degree of relaxation is slight and there is no evidence that the condition will be progressive. No treatment is indicated. When there is a definite urethrocele, some sacculation develops and terminal dribbling and incontinence may arise. When there is a rectocele, some difficulty in evacuation of the rectum occurs and this leads to the use of laxatives or enemas with the development of a cathartic or enema habit. Not infrequently a spastic colitis develops which cannot be cured until the pri-

mary muscular inefficiency is remedied. This can be accomplished only by operation which restores the muscular competency of the perirectal musculature and obliterates the rectal culdesac which arrests the fecal column. Commonly these foregoing conditions, which are designated urethroceles, cystoceles, and rectoceles, are progressive and the symptoms become aggravated. They form a background for more extensive genital relaxations.

Protrusion of parts is noted by the woman and necrosis, ulceration, bleeding and infection associated with purulent discharge may result. The patient complains of a sensation of pelvic weight and drag. Over a period of years this disability may cause more general symptoms with marked fatigability, loss of weight and incapacity for the usual activities even of those which are consistent with advancing years. The diagnosis presents little difficulty as the history and bimanual examination usually settle the question. It should be kept in mind that the relaxation is not so apparent on vaginal examination with the woman in the dorsal position. It is necessary to have her strain and bear down to bring the parts into view. Occasionally, it is desirable to examine her in the erect position. The diagnosis should include such details as are necessary to determine the exact situation and condition of the genital structures of the neighboring organs and tissues. One should determine whether or not the urethra and bladder and the rectum are involved and to what extent. The condition of the uterine cervix and the position, size, etc., of the uterus must be noted. Elongation of the cervix is common and is usually the result of stretching due to the holding or supporting of the corpus by its structures while the cervix is pulled downward as the result of gravity and insufficient support of the vaginal walls which are attached to the portio. We commonly speak of degrees of prolapse, but such a classification is arbitrary and incompletely descriptive of the condition. The uterus may descend to the lower portion of the pelvic canal without appearing at the introitus or the vaginal walls may be completely everted carrying the uterus along with them so that this organ no longer remains within the pelvis.

It is necessary in making a diagnosis to determine just what the conditions are as these determine in a large measure the type of treatment to be used. The treatment may be considered under

four main headings: the prophylactic, the arrestive, the palliative and the curative. The prophylactic consists first of having women educated to assume proper posture and to secure normal physical development, and during pregnancy by early antepartum care, malpositions (as retroversions) of the uterus can be detected and corrected and the uterus can be maintained in proper position during the early months of gestation. Otherwise the tissues are soft, the uterus is growing and it may be held in the hollow of the sacrum under the promontory until the pressure of growth pushes it up and out of the pelvis. The replacement of such a retroverted uterus is usually easy and a Smith-Hodge pessary will maintain an anterior position until the uterus is large enough to ride above the pelvic brim about the third or fourth month. With the uterus in normal position the bladder and rectum can function more normally. The natural position and normal functioning of both rectum and bladder during pregnancy is important in preventing any overdistention or weakening of their walls.

During the first stage of labor it is important that the normal physiology be carried out. Any attempt to hurry or force delivery by bearing down or by traction with forceps, etc., on a cervix which is incompletely dilated may result in damage not only to the cervix but also to the surrounding and supporting structures of the upper vagina, the uterus, the bladder and the rectum.

The passage of the fetus, especially the head, through the birth canal stretches, tears and compresses the soft maternal tissues. They have excellent elastic properties but often irreparable damage is done and the supports are permanently weakened. Some but not all, of this injury can be avoided. Either too rapid or too delayed passage through the bony canal may be harmful. The former because actual tearing of tissues may result from lack of sufficient time in which to adjust themselves by gradual dilatation; the latter because of prolonged pressure with ischemia and necrosis of the tissues. In addition, there is always the question of infection which may interfere with proper tissue healing. It is difficult to lay down hard and fast rules as the proper conduct of labor is the result of good judgment and good technic. Both normal and artificial deliveries must be conducted with a proper regard not only for immediate but also for remote results.

Another important factor is the preservation of

the pelvic floor. Lacerations of varying degrees are common. It was formerly thought and taught that the criterion of a good delivery was the absence of a laceration. Very few, if any, primiparous women are delivered without some laceration or injury to the vaginal membrane, muscles or fascia of the pelvic floor or perineum. Some can be delivered without injury to the skin over the perineal body. The extent of the damage and the remote result cannot always be determined immediately. Suture of the open wounds which resulted has long been advocated. The tissues are often bruised, irregularly torn and difficult to approximate accurately. In view of the fact that these injuries are very common and cannot be avoided because they are often rather difficult to repair satisfactorily and for the reason that deeper lying tissues are often injured by overstretching, the operation of episiotomy has gained ground greatly in its use.

Median and mediolateral incisions are made; the latter is more commonly employed. This opens the pelvic floor, makes a clean-cut wound, and minimizes the amount of stretching of the musculo-fascial structures of the pelvic floor. It is easier to secure the proper apposition of the parts after an episiotomy than after an irregular laceration. One should restore the perineal wedge by reconstructing the backward inclination of the lower vagina and the introital ring. The sutures should approximate and not strangulate the tissues. Hemostasis should be complete and the perineal wound should be and should remain clean. Hematomas and infection interfere with normal healing and imperil both the immediate and the remote results.

Care during the puerperium is important as infection of lacerations and episiotomy wounds must be prevented, and if infection occurs, proper treatment by heat, drainage, etc., instituted. Strain on the traumatized tissues must be avoided as much as possible by avoiding fecal accumulation and difficult evacuation of the rectum. Overfilling of the bladder must be prevented. These measures are especially important during the first week while healing is taking place.

Exercises should be used to improve the tone and reestablish the strength of the abdominal muscles. After the first week or ten days the latero-prone position, the knee-chest position and later even the monkey walk may be successively employed.

The patient should return for a postpartum examination in a month or six weeks, and if a retroverted uterus is found, its position should be corrected and a pessary worn for several months until the round ligaments and other supports are fully involuted and have returned to relative normality.

The knee-chest position is a valuable procedure for women to follow more or less routinely, especially for those who are susceptible to retroversion. Needless to say, the optimal physical status should be maintained. If certain degrees of relaxation are found, attempts should be made to arrest their progress by the attention to the patient's general condition, her habits and by local supportive treatment. It is important to avoid strenuous exercise which increases intra-abdominal pressure, to shorten periods of time, when the woman is on her feet either standing or working, by intervals of rest in the horizontal position. These measures will not cure the condition but may arrest or slow its progress.

Palliative treatment consists chiefly of the above suggestions and the use of some of the various types of hard rubber pessaries. The type varies with the case, and it is necessary to fit them carefully and check them monthly to see that no tissue damage is produced. They may cause irritation, discharge and decubitus if not used properly. The tissues of different patients react differently to the presence of such a foreign body. Some tolerate them for months and years and others have difficulty using them at all.

The only cure is surgical, and manifold operations have been devised but relatively few have stood the test of time. One may view the cures as symptomatic relief or as anatomic restorations. The former is what the patient desires, but it is often impossible to obtain it by any anatomic restoration which approaches the normal. Formerly, many procedures were advocated by which the uterus was removed with the result that the uterus no longer prolapsed but other structures did. It was anchored to the abdominal wall, but the tissues stretched and the parts descended.

Gradually the etiologic factors have come to be better understood and methods of reestablishing proper mechanical relations have been devised. The various mechanical factors were discussed earlier and their practical application explained.

It is not possible to discuss in detail the va-

rious operative procedures which have been and can be used. The same operation cannot be used in all cases satisfactorily, but that procedure which makes it possible to use the principles to the best advantage is the one to employ in a given case. First, the tissues which support any relaxed part must be restored or so replaced as to provide the necessary support. This applies to the anterior vaginal wall, urethra and bladder as well as to the posterior wall and rectum. Second, accessory supports must also be restored or replaced. Third, provision must be made to maintain a balance between pressure and counter-pressure by a mechanism which will effectively close the hiatus when these two forces are opposed. The simile which appeals to me as most explanatory is that of a hinge. There must be some more or less fixed point on which the leaves turn. With the normal structures the uterus turns on its cardinal ligaments. Normally exerted pressure pushes it downward and forward into the uterovesical space and tends to compress the bladder between it and the endopelvic fascia. The cervix is thrown backward and upward and tends to close the vaults and tighten the vaginal walls and support the uterorectal pouch. The counter pressure from below is exerted by the levator and perineal muscles which raise the perineal body and posterior vaginal wall upward and forward to close the vagina and approximate the leaves of the hinge. If the uterus has a poor swivel, the mechanism fails, if the uterus lies in retroversion the hinge no longer closes properly, and if the lower leaf is defective the mechanism fails.

One has to consider two main facts in deciding upon an operation. One is that the childbearing function is to be preserved. The other is that no

consideration need be given to further reproduction. In occasional cases no consideration need be given to marital relations. These viewpoints often exert a determining effect on the selection of the type of operation.

It is apparent that the removal or retention of the uterus modifies the procedure to be employed. It is obvious that no type of operation can be successful which does not provide a proper hinge-like action of the pelvic structures. Whether the uterus is removed or left, this mechanism must be maintained. This means a swivel and two leaves of the hinge, the one above and the other below. The normal uterine guys or substitutes must maintain the uterus in equilibrium. The cardinal ligaments or substitutes must be provided and the anterior and posterior vaginal wall supports must be restored or replaced. If the uterus is removed, the broad, the round ligaments and other supporting tissues must replace its function. Whether the operation is done from below or above or both, these principles must be followed. It seems apparent that all the necessary steps of such an operation cannot be accomplished solely by an abdominal operation.

The technic of these operations is not easy to acquire and can only be obtained by experience and training. It is said that "practice makes perfect"; the continued use of correct technic approaches perfection, the repetition of errors never produces perfection.

It is not possible, even with the best of technic, to secure cures either symptomatic or anatomic in all cases, but careful application of correct mechanical principles and the attainment of adequate operative technic will secure satisfactory results in the great majority of even extreme degrees of prolapse.

DIGITALIS FOR OBESITY

Too much publicity has apparently been given to the reports of a method of weight reduction which involves administration of digitalis for suppressing the appetite. Whether or not digitalis can produce a loss of appetite without harmful effects is debatable. The work of Hatcher and Weiss in particular has shown that the nausea produced by digitalis is a reflex the sensory organ for which does not appear to be located in the heart. Thus the type of nausea which digitalis produces is at least partly due to factors other than gastric irritation. Indeed, nausea and vomiting are toxic symptoms of digitalis and constitute a warning to decrease or stop the administration of the drug. Confirmatory evidence for this method of reducing body weight is lacking. The method cannot be generally recommended unless its efficacy and safety have been thoroughly demonstrated by carefully controlled observations. (J.A.M.A., June 8, 1940, p. 2311.)

THE LOCAL USE OF SULFATHIAZOLE IN THE TREATMENT OF STAPHYLOCOCCAL INFECTIONS*

Preliminary Report

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RECENT developments in the field of chemotherapy include the successful use of sulfathiazole in the treatment of staphylococcal infections. We have recently participated in the treatment of fifteen patients from whose blood streams staphylococci were isolated before instituting specific therapy with this drug. In every instance, the blood was rendered sterile following the administration of sulfathiazole. Details of this experience with sulfathiazole in the therapy of patients with staphylococcal septicemia will be recorded elsewhere. We observed that whereas blood cultures remained sterile after sulfathiazole had been administered, and the patients' general condition improved, organisms could be consistently cultured from localized lesions. In other words, the drug appeared to control the infection, but there remained the potential danger of invasion of the blood again by microorganisms existing in primary or metastatic foci. Because of our failure to sterilize these focal lesions by the oral or parenteral use of sulfathiazole, we have treated a number of individuals by the direct application of sulfathiazole to the infected areas.† Although the number of patients treated in this manner is small, the results have been so encouraging that a preliminary report is warranted.

There has existed for many years a widespread interest in the local treatment of infections with antiseptics. The most popular of these chemical compounds are those whose action depends upon the slow liberation of chlorine. They include hypochlorite solution (Dakin's solution), chloramine-T, and dichloramine-T. While it is true that the latter compounds will actually kill microorganisms and have considerable merit, their use may result in damage to the delicate granulating tissue. Cushny¹ has stated, "They act at least as strongly upon the proteins of the human body as upon the microbes invading it." Fleming² has produced evidence that practically all of the anti-

septics used in the past destroyed leukocytes. It is apparent that the ideal antiseptic would be one that injured or destroyed bacteria without causing damage to the tissues or cellular components of the host. In recent years, many investigators have advocated the treatment of infected tissues by less irritating and harmful measures. Lyth⁸ has treated a total of 1,096 patients having infected wounds by the application of a hypertonic solution of sodium sulfate to the surface of the wounds. He was impressed by the rapidity with which the local edema subsided following the use of the saturated sulfate solution. Another less drastic method of treating infected wounds has been the local application of cod liver oil dressings. Lichtenstein⁵ has recently reviewed the extensive literature on this subject and points out the advantages of employing this agent. He added experimental data of his own showing that cod liver oil is actually bactericidal for microorganisms which commonly invade injured tissue. Irradiation appeared to increase the activity of the cod liver oil. He suggested that the bactericidal action of the oil was dependent upon the organic peroxides that it contained. We have pointed out the success that has attended the use of these less irritative methods because we have utilized them in addition to the local use of sulfathiazole.

It should be pointed out that there exists some skepticism concerning the local use of sulfanilamide and its derivatives in the treatment of infections. Fleming³ observed that bacteria and peptones inhibit the bacteriostatic action of sulfanilamide. Disintegrating leukocytes in a wound liberate proteolytic ferments, which in turn break down proteins to peptones. Lockwood^{6,7} and others⁹ have also shown that peptones inhibit the action of sulfanilamide. In the treatment of wounds, Fleming² advocates the oral administration of sulfanilamide; adequate drainage; and irrigation with hypertonic solutions, which will increase the rate of transudation and aid the local action of sulfanilamide which may reach

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†Sulfathiazole was supplied by the Squibb Institute for Medical Research.

the infected tissue. We have been impressed with the success that Jensen and his associates at the Minneapolis General Hospital⁴ have had following the implantation of sulfanilamide in contaminated wounds resulting from compound fractures. They have not observed a primary wound infection in thirty-nine compound fractures treated in this manner. Ninety-four open fractures treated in a similar manner but without sulfanilamide resulted in 27 per cent of the patients having infections.

Material and Methods

Sixteen patients with localized staphylococcal infections have been treated by applying sulfathiazole directly to the lesions. The following principles and procedures have been employed which appeared most likely to give the optimum therapeutic result in the therapy of these patients:

1. Depending upon the site of the lesion, immobilization and elevation of the infected area were used to enhance the return flow of the circulation. Wangenstein^{10,11} has emphasized that such a procedure alleviates pain and reduces swelling.

2. Adequate surgical drainage and debridement of devitalized tissue were utilized.

3. Sulfathiazole was applied directly to the lesions to permit a much higher local concentration of the drug than could be obtained when it was given orally. In patients acutely ill, sulfathiazole was also administered by mouth. This procedure was directed against a possible bacteremia, and to prevent an extension of the primary focus. Several methods were utilized in impregnating the infected tissue with sulfathiazole. In some instances, sulfathiazole crystals were implanted directly into the septic part. A 1 per cent aqueous solution of sulfathiazole was also employed as an irrigant and in wet packs applied to the lesion. Since, as has been pointed out, the local application of cod liver oil is attended with beneficial effects, on some occasions, one per cent sulfathiazole was suspended in cod liver oil or included in a cod liver oil ointment with vaseline as a base, and the cod liver oil-sulfathiazole mixture placed directly on or in the infected part. More specific data pertaining to the use of sulfathiazole in these patients will be presented shortly.

4. To prevent the inhibitory action of bacteria, exudate, and necrotic tissue upon sulfathiazole,

the wounds were irrigated frequently with warm, saline solution, and following each irrigation, sulfathiazole was put into the wound. In a few patients, particularly those with carbuncles, it was observed that irrigations with Dakin's solution aided considerably in the removal of purulent and sloughing material.

Results

A summary of the types of lesions treated and the results are shown in Table I. Staphylococci of the *aureus* type were isolated from every lesion. The following comments are presented to clarify the therapeutic method used in the various types of lesion:

Carbuncles.—Because of the size of the abscesses in all four patients, it was necessary to incise them and excise necrotic material. Following this procedure, sulfathiazole crystals were placed in the cavity of the wounds in three of the four patients. Additional crystals were put into the wounds daily for two to six days. It was surprising to observe how clean the wounds appeared following the application of the sulfathiazole. In treating the fourth patient, a one per cent suspension of sulfathiazole in cod liver oil was applied directly to the infected area twice daily for thirteen days. This method of application was also used in two of the three patients into whose cavities sulfathiazole crystals alone had been previously used. The utilization of the sulfathiazole-cod liver oil mixture compared very favorably with the use of sulfathiazole crystals. Two of the patients were so acutely ill that sulfathiazole tablets were administered orally. In two patients, dichloramine-T and Dakin's solution were used to aid in the removal of necrotic tissue. The lesions of three of the four patients healed rapidly without the use of skin grafts, while the lesion of the fourth patient appeared to be healing well until the use of sulfathiazole was discontinued, and suppuration recurred soon after. It is of interest that very little of the sulfathiazole appeared to be absorbed from the local area, since analyses of blood samples showed only traces of the drug present.

Operative Wound Infections.—The wounds of three of the patients were treated with a one per cent suspension of sulfathiazole crystals in sterile distilled water used as an irrigant. The wounds were irrigated two to three times daily, and dress-

ings saturated with the solution were applied. The results were highly satisfactory. The bacterial counts showed a considerable reduction in the number of colonies present within a day or two, and the degree of suppuration diminished at the same time. The wounds of two other patients were treated by applying a one per cent suspension of sulfathiazole crystals in cod liver oil to the surface. This was repeated three to four times a day for several days, and again the results were satisfactory. In one patient, sulfathiazole crystals were dusted on to the wound twice a day for ten days, following which the wound healed completely.

Decubitus Ulcers.—One patient was treated. The result was very gratifying in view of the previous attempts at therapy. The patient was a young male who had had a traumatic myelitis. Due to trophic disturbances, a large ulcer appeared over the sacral region. Staphylococci were cultured from the lesion. Attempts to control the infection included the use of packs saturated in saline solution and sulfanilamide powder dusted onto the involved area. Following this, two attempts were made to hasten epithelization with pinch skin grafts, but in each instance autolysis of the transferred skin took place. Finally, sulfathiazole crystals suspended in cod liver oil were applied three times a day for seven days to the ulcer. At the end of this time, the granulation tissue appeared clean, and an attempted skin graft was successful. The surface of the ulcer became completely epithelized.

Corneal Ulcers.—One patient with bilateral corneal ulcers was treated in coöperation with Dr. T. J. Edwards. The ulcers involved the greater part of the center of both corneæ. They had resisted several forms of local treatment over a period of a month, and it was thought for a time that the vision in both eyes would be lost. At this time, sulfathiazole crystals were dusted into each eye daily. A Saemisch section was carried out at the upper advancing margins of the ulcers of each cornea. Immediate improvement was observed, and after seventeen days of sulfathiazole therapy, the ulcers had healed completely.

Chronic Osteomyelitis.—A number of patients having chronic osteomyelitis had been previously treated with sulfathiazole administered orally.

No apparent beneficial effect was observed. Two patients were treated by placing five grams of sulfathiazole crystals into the infected area. The first patient, a seven-year-old female, had osteomyelitis of the tibia. A sinus leading to the bone and the involved portion of the bone were debrided, and then sulfathiazole placed in the bony defect. A plaster cast was placed on the extremity. Four days later, the wound was examined through a window cut in the cast. It appeared clean, but staphylococci were isolated from the wound. Additional crystals were placed in the cavity, and the patient was sent home. Three months later examination revealed the wound to have healed, and an x-ray film showed extensive replacement of the defect in the tibia by new bone. A second patient has been treated recently in a similar manner, and further time must elapse before an opinion can be expressed concerning the effect of this therapy.

Pyo-pneumothorax.—This represents another type of lesion that we have attempted to treat with sulfathiazole. One patient, an adult female, had been receiving pneumothorax therapy for pulmonary tuberculosis over a long period of time. An effusion appeared in the air-containing right pleural cavity. Purulent exudate was aspirated from the cavity, and staphylococci isolated from the material. It was decided to aspirate the cavity thoroughly, and replace it with 250 c.c. of a one per cent aqueous suspension of sodium sulfathiazole. This was done on two occasions. Sulfathiazole was also administered orally. Microscopic examination of gram-stained smears of the exudate revealed myriads of cocci, a few of them intracellular. After the introduction of sulfathiazole into the pleural space, most of the organisms were intracellular, and those remaining outside of the cells stained poorly, and appeared abnormal in shape. However, the amount of fibrin had increased, presumably because of the alkalinity of the sodium sulfathiazole solution. An aqueous suspension of sulfathiazole was then used. Following this, the number of organisms was reduced, but staphylococci were consistently isolated from cultures of the exudate. This patient's general condition improved so much that a multiple stage thoracoplasty was begun to obliterate the cavity.

Subcutaneous Abscess.—An adult male with a large subcutaneous abscess had also received sul-

SULFATHIAZOLE IN STAPHYLOCOCCAL INFECTIONS—SPINK AND PAINE

TABLE I. SUMMARY OF STAPHYLOCOCCAL LESIONS IN SIXTEEN PATIENTS TREATED WITH LOCAL APPLICATION OF SULFATHIAZOLE

Type of Lesion	Number of Cases	Results
Carbuncle	4	3 granulated in without skin grafts. 1 doubtful result.
Operative wound infection	6	All lesions rendered sterile. Healed.
Decubitus ulcers	1	2 previous attempts with skin grafts failed. After sulfathiazole, grafts successful.
Corneal ulcers	1	Sterile lesion with complete healing after sulfathiazole.
Chronic Osteomyelitis	2	1 showed extensive bone repair three months later. 1 therapy too recent to judge result.
Pyo-pneumo-thorax	1	Number of organisms reduced but cavity not sterilized.
Subcutaneous abscesses	1	Improvement. Died of leukemia.
	16	

fathiazole by mouth with no apparent effect on the abscess, but there was improvement in his general condition. Cod liver oil was applied to the subcutaneous lesion with but little improvement. Sulfathiazole in cod liver oil was then applied daily for thirty-two days. There was marked improvement following this therapy. The lesion granulated in, and partial epithelization took place. However, complete healing was not obtained. The patient expired because of myelogenous leukemia.

Comment

The ultimate goal in the treatment of all septic wounds is to control the infection and promote healing of the tissue. In evaluating any therapeutic measures, the time factor is of importance. While the observations have been few, operative wound infections appeared to heal more rapidly following the application of sulfathiazole than when other antiseptics were used. Final judgment is dependent upon comparative observations made upon a larger series of patients. The management of patients with staphylococcal sepsis must include effective therapy of localized

lesions. While it is recognized that the oral and parenteral use of sulfathiazole will control staphylococcal bacteremia, complete eradication of focal infections is dependent upon other methods. If this is not accomplished, the localized infection may be the source of repeated bacterial invasions of the blood, which in turn may be followed by metastatic foci. Staphylococcal infections are notorious for this sequence of events.

It is quite likely that the best results with the local use of sulfathiazole will be obtained in those lesions that can be approached directly, such as infections of the skin and adjacent tissue. Its use in the management and control of chronic osteomyelitis merits further investigation. It is doubtful whether sulfathiazole introduced into the pleural cavity will completely control infections in this area. The use of sulfathiazole in cod liver oil appears very promising, and it is our intention to treat a larger number of patients in this manner. Emphasis must be placed upon the necessity of employing certain general principles of therapy, along with the local application of sulfathiazole, such as immobilization and gravity drainage, removal of necrotic tissue and purulent material; and frequent irrigation of the infected area.

Summary

1. Localized staphylococcal lesions in sixteen patients have been treated by applying sulfathiazole directly to the infected area.
2. The sulfathiazole preparations used have included sulfathiazole crystals alone; an aqueous suspension of sulfathiazole used as an irrigant and for saturating dressings; and sulfathiazole suspended in cod liver oil. In acutely ill patients, sulfathiazole was also administered orally.
3. The success of the local use of sulfathiazole is dependent, in great measure, upon maintaining a lesion free of purulent and necrotic material. This was accomplished by debridement and frequent irrigations.
4. The foregoing clinical results warrant further investigation of this form of therapy.

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AIR-BORNE POLLEN IN THE TWIN CITIES AREA WITH REFERENCE TO HAY FEVER*

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CONSISTENT success with specific pollen therapy in the treatment of hay fever and pollen asthma demands an accurate and complete diagnosis of the causes for each case. Erroneous conceptions relative to the ultimate value of the skin test in the diagnosis of hay fever causes appears to be widespread among physicians, as judged from frequent and numerous personal communications received by one of us. That skin sensitivity and clinical sensitivity do not always coincide has long been known, a fact which we have previously emphasized.^{10,11} That patients often exhibit positive skin tests to pollens which do not excite symptoms in the respiratory mucous membranes is a fact concerning which many physicians appear to be uninformed. This state of affairs would appear to indicate that the profession in general is not sufficiently informed concerning the periodicity of atmospheric pollution by the pollen of various species of plants, and considering the paucity of accurate information which has been available in this region until recently, such deficiency on the part of the general profession in the past is excusable. It is time we realize, however, that an *accurate* diagnosis of the causes of hay fever for the individual patient is possible *only when accurate data concerning the specific pollens which pollute the atmosphere in his locality coincident with his period of symptoms*, are available.

Following Blackley's work which proved the etiologic rôle of the pollens of certain grasses in connection with hay fever and seasonal asthma, evidence quickly accumulated that pollen from other plants was also involved. In the incomplete knowledge of that period the erroneous presumption arose that any plant producing pollen

is a potential cause of hay fever. This early and somewhat hasty extension of Blackley's work led to many erroneous notions which are still widespread among the laity and also to an undesirable extent among physicians. The next important advance came with the realization that significant atmospheric pollution results only from those plants which pollinate through the agency of wind and hence only these are important potential causes of hay fever, which fact was pointed out by Scheppegrell¹⁸ in 1917. Showy plants, such as roses, goldenrods, dandelions, daisies, and others which are often accused, were exonerated by the critically minded when it became recognized that the pollen of such plants is not wind carried. The significance of Scheppegrell's contribution deserves emphasis since it provided a basis for compilation of lists of wind-pollinated and therefore the potentially true hay fever causing plants in any particular region. Such lists were derived from botanical works and often with inadequate field observations. Following extensive field observations over a period of many years, such a compilation of the potential causes of hay fever for the State of Minnesota was published by us¹⁰ in 1933. Notwithstanding a certain value attached to this kind of information, it leaves much to be desired, since it must be admitted that such evidence as related to hay fever is entirely circumstantial for it does not disclose whether as a fact or to what extent pollen of the plants listed actually pollute the air.

The application of the method of air analysis by means of pollen counts marked the next advance in knowledge of hay fever causes, and has supplied data of a more exact nature. The method which appears to have been devised by Airy,¹ involves the exposure of microscope slides coated with a viscous material for a definite time (twenty-four hours) and subsequent identification and

*From the Department of Botany and the Students' Health Service, University of Minnesota. This study was financed in part by a grant from the research fund of the Graduate School, University of Minnesota.

enumeration by microscopy of the various kinds of pollen present on a definite area of slide surface. The date on which pollen grains of a given species first appear on the exposed slides determines *exactly* the beginning of atmospheric pollution by that species, the number over a given area of surfaces furnishes a quantitative index of the pollution and its complete disappearance indicates that the period of bloom of the species which produced it has ended.

It can be expressed as a dictum that the period during which the atmosphere contains appreciable quantities of pollen of a given species is to be regarded as the effective clinical period for the species. The thesis of this study has thus been one in which the data would give a diurnal measure of *all* kinds of pollen present during the entire season of pollination (late March through mid October in this region). It is only on such a basis that data, permitting the complete and accurate diagnosis of pollen sensitivity can be obtained, for as we have previously pointed out,^{10,11} a positive skin test does not always indicate clinical sensitivity.

Methods

In obtaining daily records of the pollen content of the air, the so-called gravity method was used. This simple method consists of the exposure of an ordinary microscope slide (viscous coated) in the horizontal position, to the atmosphere for twenty-four hours. The material used for coating the slides was a mixture of three parts of petrolatum, one part of liquid paraffin oil, and one part xylol. If the ingredients are placed in a beaker and gently heated, a uniform mixture is obtained. This preparation is especially useful where prepared slides are being sent to distant stations for exposure. In order that slides might be obtained on rainy days, all slides were exposed under a protective cover, about 10 inches above the slide, which allowed free passage of air but yet excluded most of the rain. The enumeration of each kind of pollen was carried out as follows: Twenty-five microscopic fields (low power, 100X) systematically distributed across the width of the slide in five strips (Fig. A) were examined and the number of pollen grains of each kind recorded. The data thus accumulated may be used to express a quantitative estimate of the amount of atmospheric pollution during the period for which the slide was exposed.

Some workers¹² prefer to present this kind of

data on the number of grains per square centimeter of surface, and Feinberg⁶ has recently expressed the view that, of the several methods, this



Fig. A. Position observed on exposed, oil-coated microscope slide (each circle represents a low-power field having, in our study, an area of 1.55 sq. mm.).

is the most practical and recommends its adoption as standard. The number of pollen grains per square centimeter of surface may be calculated as follows:

Area of 1 microscopic field (100X) in sq. mm. (1.55 sq. mm. in our study) X 25 (number fields counted) = area examined.

Since 1 sq. cm. = 100 sq. mm., then

$$\frac{100}{\text{Area examined (sq. mm.)}} = \text{Factor (F}_A\text{) by}$$

which the number of pollen in twenty-five fields must be multiplied in order to obtain the approximate number occurring in one square centimeter of exposed surface.

Since Scheppegrell¹⁹ devised the method, it has seemed desirable to express atmospheric pollen pollution in terms of the approximate number of pollen grains per cubic yard of air. This kind of information appears to be somewhat more tangible than the amount per surface area, notwithstanding the fact that the surface area values serve as the basis for the calculation of the pollen-grain-per-cubic-yard-of-air values, (application of Stokes' Law). Confusion recently has arisen concerning this method of expression of data, since Cocke^{5,6} has called attention to certain errors in the factors devised by Scheppegrell¹⁹ and our own investigations indicate that Cocke's corrected factors were also incorrect in certain instances. Detailed discussion of the controversies involved are beyond the scope of this paper; however the factors, recalculated and checked, used in calculating the pollen-grain-per-cubic-yard of air values, expressed as the B values in the accompanying figures, are presented in Table I. There is obviously a great need for a standard pollen count formulæ and it is hoped that the recently organized Committee on Aerobiology of the National Research Council will assist in bringing order to a rather uncertain state of affairs. It is pertinent to point out that from

TABLE I. FACTORS FOR CALCULATING APPROXIMATE
NUMBER OF SMOOTH POLLEN GRAINS PER
CUBIC YARD OF AIR

(Revised from Cocke)

If n = pollen grains per cubic yard, N = pollen grains per sq. cm. in twenty-four hours, and $F_{(B)}$ = the calculated factor, then

$$n = N \times F_{(B)}$$

<i>Diameter of Pollen Grain</i> (micra)	<i>Factor ($F_{(B)}$)</i>
10	28.93
12	20.09
14	14.76
15	12.86
16	11.30
18	8.93
20	7.23
22	5.98
24	5.02
25	4.63
26	4.28
28	3.69
30	3.21
32	2.83
34	2.50
36	2.23
38	2.00
39	1.90
40	1.81
42	1.64
44	1.49
46	1.37
48	1.26
50	1.16
60	1.80
70	0.59
80	0.45
90	0.36
100	0.29

a clinical standpoint it is of importance that pollen data demonstrate the following facts:

1. The approximate time (variability is not great) at which a specific kind of pollen annually makes its appearance in the air and when it reaches clinically significant concentration.

2. The duration of the period for which clinically significant amounts are present.

3. The date (approximate) at which the concentration drops below the level of clinical significance.

Regardless of the unit employed in the recording of data, when graphically portrayed most of these requirements are satisfied. Uncertainty and difficulties arise only in comparisons of data recorded by one investigator with that of another when different standards are employed.

In view of the present uncertainty of methods of calculation, we are expressing our data as shown in the accompanying figures on the following bases:

A. The number of pollen grains per square centimeter of slide surface exposed for twenty-four hours.

B. Pollen grains per cubic yard of air as calculated by Cocke's factors (Revised by the authors).

C. Pollen grains per cubic yard of air as calculated by Scheppegrell's factors.

The letters designating the above bases correspond to the respective values as they appear in the accompanying graphic presentations (Figs. 1 to 19). The values stated are the means of data collected at two stations: No. 1—Botany Building, University of Minnesota, exposure about 60 feet above ground; No. 2—Residence, South Minneapolis, exposure 15 feet above ground.

At Station No. 1, simultaneous exposure of slides at 20-foot and 60-foot levels have given evidence of a remarkably uniform concentration of pollen up to a height of about 60 feet. Scheppegrell²⁰ has stated that up to a height of about 150 feet pollen concentration is essentially uniform. Station No. 1 serves to give evidence of conditions in rather weedy areas since it is adjacent to such areas which border the Mississippi River. Conditions at Station No. 2 are more or less typical of the usual residential sections where waste places are not frequent, and weedy growths are kept fairly well in check. The data of these two stations do not differ greatly, but it is assumed that the mean of observations at these two localities probably represents average conditions prevailing in a large portion of the Twin Cities area. While the amounts of pollution as recorded in this study cannot be strictly applied to other localities in the state, the period of pollution, which is more important, is known to be the same in those regions which do not vary greatly as to latitude.

Various kinds of pollen (representing approximately sixty genera in about twenty families) found to contribute to pollution of the atmosphere, can be arranged into sixteen clinically convenient groups, as presented in a previous publication.¹¹ Present state of knowledge indicates the hay fever exciting substance in the pollen of closely related species to be the same. Patients sensitive to tall ragweed without exception exhibit positive skin tests to short ragweed, marsh elder, and other related weeds. A patient sensitive to oak pollen is sensitive to all species of oaks, et cetera.

The problem of diagnosis is greatly simplified through the reduction of a large number of species to a relatively few antigenic groups. The soundness of this principle has been proved through several years of application in the treatment of hundreds of cases.

Although the bulk of the data is presented in graphic form (Figs. 1 to 19) some discussion seems essential. The groups are presented in essentially chronological order, that is, from the standpoint of season. Plants are referred to by names which appear in Gray's Manual.¹⁷ Likewise, the authors of the botanical names are those given in this work.

Group 1.—Maple, Box Elder Group (Family Aceraceæ)

Of this group, Soft Maple (*Acer saccharinum*) and Box Elder (*A. Negundo*) are of greatest importance, since they produce most of the pollen recorded. Box Elder is the only strictly wind-pollinated member of the group, the others being mostly insect-pollinated. Soft Maple is noteworthy since it is the first plant to shed pollen in this region. Field studies show that pollination may occur as early as March 12^{18,19}. Pollen concentration in the vicinity of Soft Maple trees would definitely be rather high, but since its rather large pollen grain (40 μ) lacks buoyancy, it is not carried for very great distances. Both stations have few Soft Maples in their immediate vicinity, and, as a consequence, the pollen count is low; the highest concentration for any twenty-four-hour period being 34 grains per square centimeter on April 9, 1933. The concentration of Box Elder pollen is strikingly different, for the highest count was 285 pollen grains on April 29 in 1934. Here would appear to be a good example of the rôle which mode of pollination plays in the provisions of the sensitizing agent for, as was stated earlier, Box Elder is strictly wind-pollinated while other maples are almost wholly insect-pollinated. The period April 21 to May 1 represents the time during which the pollen concentration is critically high. It is worthy of note that the records for three out of the four years are quite similar. In 1934 a cold, late spring caused the peak of pollen production to come about one week later than usual (Fig. 1). Such variations in temperature are of importance, since they are correlated with rather marked changes in pollen concentration.^{7,19}

Group 2.—Birch, Hazel, Ironwood Group (Family Betulaceæ)

Members of this group are not overly abundant in the areas immediately surrounding the two stations, which fact probably accounts for the variability seen in the data. Pollen grains of birch and its allies (which average about 30 μ in diameter) are quite buoyant and are therefore carried by winds for some distance. Indeed, pollen grains of the birch family have been caught 34.1 miles out in the sea and at heights of more than 2,000 feet in the air.⁴ Likewise Erdtman¹³ has observed occasional pollen grains of Alder at a distance of more than 400 miles off the coast of Newfoundland. It is thus to be expected that alteration of either wind velocity or wind direction and the occurrence of rain would contribute to the variability seen in the pollen concentration (Table II). Relatively high pollen counts are attained during the period April 28 to May 11. The entire pollinating season extends from April 7 to May 30 (Fig. 2).

Group 3.—Poplar, Willow Group (Family Salicaceæ)

Cottonwood (*Populus deltoides*), which belongs in this group, produce large quantities of pollen. At the peak of pollen production in 1934 (April 28), the concentration was 1,013 grains per sq. cm. The extent of the season during which the pollen count is of importance is about ten to twelve days, beginning with April 20. High concentrations were observed on April 23 and 24 during three out of the four years. The willows are largely insect-pollinated and their pollen never fills the air to the extent that cottonwood pollen does. Since the exine (outer wall) of their rather small pollen grains (25 μ in diameter) is finely ridged (striate-reticulate), most of the pollen occurs in masses heavy enough to fall rather quickly to the ground. However, some pollen of various species of willow (Pussy-willow—*Salix discolor*, sand-bar willow—*S. Longifolia*, Peach-leaved willow—*S. amygdaloides*, Weeping willow—*S. babylonica*, et al) are consistently found on the slides. During the first half of May the maximum concentration may be as high as 74 pollen grains per square centimeter (May 3, 1935). Since various kinds of willows pollinate throughout May, they serve to prolong the pollination period of this group (Fig. 3).

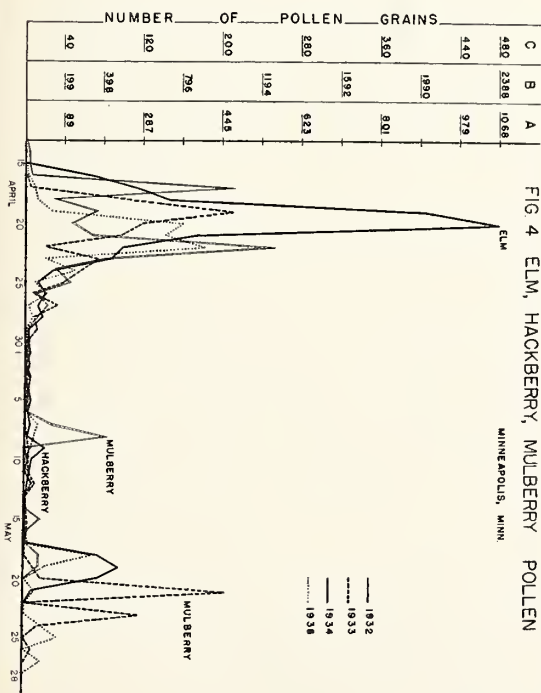
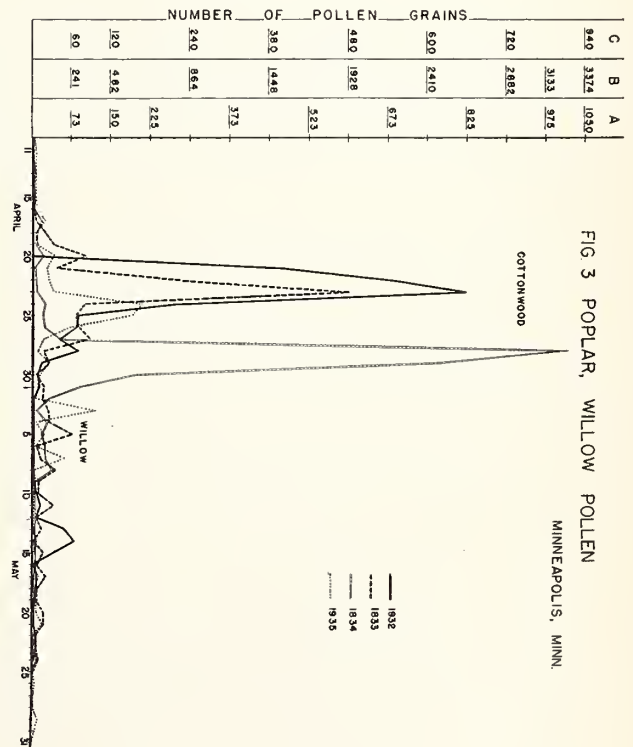
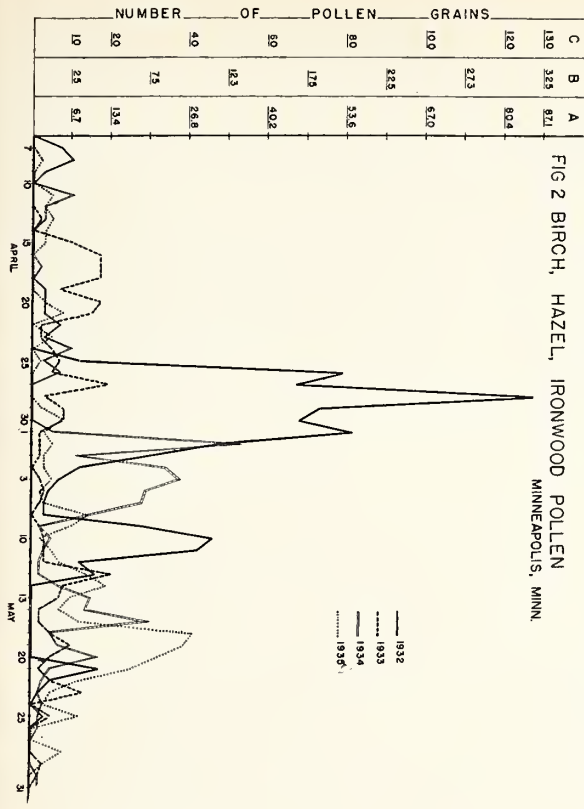
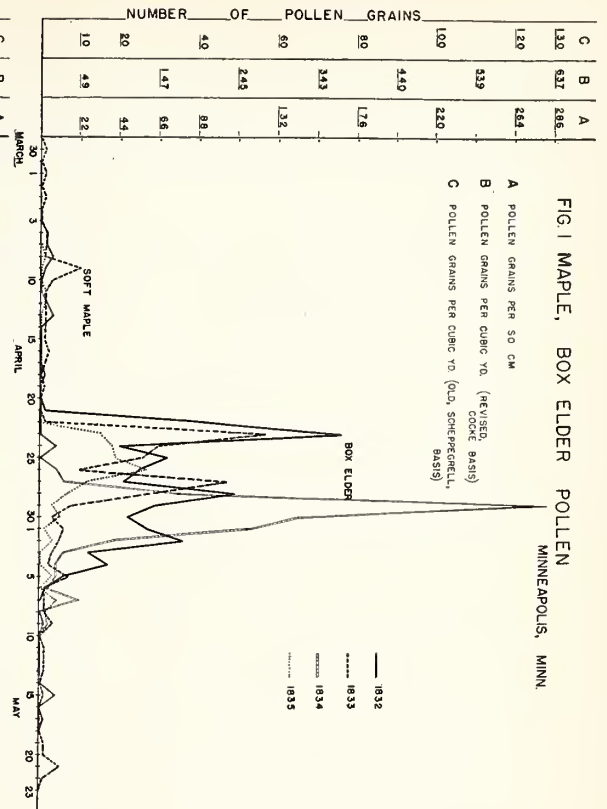


TABLE II. DATA SUMMARIZING THE BEHAVIOR OF AIR-CARRIED POLLEN

GROUP	TOTAL POLLEN COUNT (Summation of daily 24-hour concentrations) (number per sq. cm.)				Duration of pollination (four years' data)	Date of Highest Pollen Count (Mean of two stations)				Highest 24-hour Count (in pollen grains per sq. cm.)		
	1932 1933 1934 1935 Average					1932	1933	1934	1935	Station 1	Station 2	
	1932	1933	1934	1935								Average
I. Maple, Box Elder	924	609	793	271	650	3/22- 5/23	April 23	April 23	April 29	April 26	505	
II. Birch, Hazel	979	346	542	465	583	4/ 7- 5/30	April 28	May 13	May 2	May 18	193	
III. Cottonwood	2,703	1,817	2,364	904	1,947	4/ 7- 5/31	..	..	..	..	..	..
a. Cottonwood	2,560	1,540	2,221	714	1,759	4/11- 5/20	April 23	April 23	April 28	April 25	1911	93
b. Willow	143	277	143	190	188	4/ 7- 5/31	May 14	May 5	May 1	May 3	..	..
IV. Elm, Nettle	4,338	2,233	2,381	2,040	2,748	4/ 8- 9/20	..	..	..	..	..	1125
a. Elm	3,667	1,704	1,978	1,395	2,186	4/ 8- 5/ 6	April 20	April 19	April 22	April 22	44	70
b. Hackberry	67	42	31	61	51	4/27- 5/23	May 9	May 12	May 7	May 21	..	70
c. Mulberry	78	112	44	74	77	5/ 6- 6/ 3	May 19	May 21	May 8	May 18	23	..
d. Nettle	267	222	173	312	243	6/ 7- 9/10	July 25	Sept. 8	July 21	Aug. 11	..	8
e. Hemp	259	152	155	198	191	6/22- 9/20	Aug. 5	Aug. 21	Aug. 6	Aug. 14	..	11
V. Sedge, Bulrush	29	245	112	122	165	4/25- 8/ 3	..	..	..	..	..	177
a. Sedge	..	..	21	40	31	4/25- 6/ 5	..	..	May 4	May 18	8	..
b. Bulrush	29	82	24	36	43	6/ 7- 8/ 3	July 18	June 7	July 23	July 16	11	..
c. Cat tail	..	162	67	46	92	6/10- 7/29	..	June 26	June 28	June 30	55	..
VI. Ash	262	143	327	262	248	4/24- 5/31	May 4	May 6	May 1	April 25	1615	..
VII. Oak	3,275	1,935	3,007	689	2,227	4/29- 6/10	May 14	May 19	May 7	May 25	462	..
VIII. Grass	3,302	946	342	1,879	1,617	5/17-10/18	June 7	June 1	July 21	June 13	..	44
IX. Butternut, Walnut	161	51	198	53	116	5/ 5- 6/18	..	..	..	..	..	17
a. Butternut	75	13	62	7	39	5/ 8- 6/ 3	May 23	May 23	May 17	May 28	..	..
b. Walnut	29	4	42	7	20	5/ 8- 6/11	May 28	May 22	May 17	June 10	13	..
c. Hickory	57	33	93	40	56	5/ 5- 6/18	June 2	June 1	May 20	May 31	40	..
X. Plantain	207	21	38	19	71	5/27- 8/ 6	June 24	June 22	May 27	June 17	169	..
XI. Dock, Sorrel	874	55	63	135	282	5/20- 8/14	June 7	June 11	July 10	June 17	6	..
XII. Sweet Clover	..	..	..	..	..	6/26- 9/ 1	..	..	June 26	July 20	95	..
Alfalfa	..	..	20	16	18	..	..	..	..	..	..	..
XIII. Pigweed	..	..	..	..	..	..	..	..	..	..	..	..
XIV. Russian Thistle	749	928	1,587	861	1,031	6/ 2-10/17	Aug. 29	Aug. 16	Aug. 21	Sept. 24	59	..
XV. Wormwood, Sage	759	223	124	255	340	7/ 3-10/16	Sept. 23	Aug. 29	Sept. 13	Sept. 17	1225	..
XVI. Ragweed	6,319	6,307	6,080	9,574	7,070	7/ 2-10/17	Aug. 29, 30	Aug. 31	Aug. 29	Aug. 23	..	..
TOTAL	24,882	15,860	17,981	17,546	19,114	..	..	..	..	..	..	..

TABLE III. SKIN SENSITIVITY IN RELATION TO CLINICAL SENSITIVITY
Analysis of 936 Cases

Nos.	Groups	Patients with Pos. Skin tests		Patients Clinically Sensitive		% of Positive Skin Reactors with Clinical Sensitivity
		No.	% of Total	No.	% of Total	
	Aceraceæ (Maple-Box Elder)	425	45.4	45	4.8	10.6
	Betulaceæ (Birch-Hazel)	182	19.4	21	2.2	11.5
	Salicaceæ (Poplar-Willow)	230	24.6	37	4.0	16.1
	Urticaceæ (Elm-Nettle)	226	24.1	207	22.1	91.6
	Cyperaceæ-Typhaceæ (Bulrush-Cat tail)	231	24.7	139	14.9	60.2
	Oleaceæ (Ash)	330	35.3	36	3.8	10.9
	Fagaceæ (Oak)	290	31.0	60	6.4	20.7
	Gramineæ (Grass)	490	52.4	462	49.4	94.3
	Juglandaceæ (Walnut-Hickory)	207	22.1	37	4.0	17.9
	Plantaginaceæ (Plantain)	219	23.4	80	8.5	36.5
	Polygonaceæ (Dock-Sorrel)	279	29.8	81	8.7	29.0
	Leguminosææ (Clover-Alfalfa)	315	33.7	190	20.3	60.3
	Amaranthaceæ (Pigweed)	584	62.4	461	49.3	78.9
	Chenopodiaceæ (Russian Thistle)	422	45.1	398	42.5	94.3
	Artemesiæ (Sage-Wormwood)	726	77.6	687	73.4	94.6
	Ambrosiaceæ (Ragweed)	835	89.2	776	82.9	92.9

Group 4.—*Elm, Nettle, Hemp Group* (Family *Urticaceæ*)

The various plants placed in this group all belong to the Nettle family; but since their season of pollination variously occurs from April through September, they have been placed into two subdivisions (Fig. 4—Elm, Hackberry, and Mulberry; Fig. 5—Nettle and Hemp). The Elms (*Ulmus americana* and *U. fulva*) pollinate within the period April 15 to 30, the maximum concentration being observed on about the 20th (1,062 pollen grains per square centimeter of surface April 20, 1932). These trees are capable of producing large quantities of buoyant* pollen and are relatively important since they are widely planted.

The explosive flowers of Mulberry (*Morus alba*) produce quantities of small pollen grains (16 μ in diameter). The latter half of May represents its normal pollination period; although in

1934 its maximum (25 pollen grains on May 8) came about two weeks earlier than usual. Hackberry (*Celtis occidentalis*) pollen has not been abundant on the slides. The highest concentration observed (usually occurring about May 10) was 25 pollen grains per square centimeter on May 9, 1932. Its pollination season extends throughout the first half of May (Fig. 4).

Nettles *Urtica gracilis*, *U. dioica*, *Laportea canadensis*) produce the smallest sized pollen grains noted in this survey (15.8 μ in diameter). They are common, widespread weeds (cf. distribution map¹¹) which normally produce pollen from about the first of July to September 10. Maximum pollen production has been observed about July 25 in 1932 and 1934, while the years 1933 and 1935 have shown highest counts during August 29, 1933; August 11, 1935). The pollination period of Hemp (*Cannabis sativa*) is essentially the same as for nettle. Its pollen grains, which are about twice the size of those of nettle, have been relatively sparse, 23 being the highest twenty-four-hour count (August 6, 1934). Max-

*The occurrence of elm pollen grains on the slides a month in advance of their normal appearance very definitely suggests that they can be transported for rather great distances. During this period elms were shedding pollen in the vicinity of Chicago, Illinois.

imum pollen production is attained during the first half of August (Fig. 5).

Group 5.—Sedge, Bulrush, Cat tail Group (Families *Cyperaceæ* and *Typhaceæ*)

As a group, these plants have never been thought of as of any great significance in the causation of hay fever. The fact remains that numerous patients are sensitive by skin test to the group (24.7 per cent of 936 cases. See Table III). Further, plants belonging in this group are often abundant in places frequently used as summer resorts or "hay fever havens."

Pollen grains of various sedges (*Carex pendunculata*, *C. longirostris*, *C. pennsylvanica*, *C. vesicaria*, et al.) have been noted during the period May 4 to June 5 (1934 and 1935). A low maximum of 8 pollen grains per square centimeter was noted on May 18, 1935.

Cat tail (*Typha latifolia*) produces large quantities of pollen grains, which usually remain together in groups of four (quartets or tetrads). Its season of pollination extends from June 10 to about the middle of July with highest concentration occurring with the close of June (June 26, 1933). During approximately the same period, pollen of various species of Bulrush (*Scirpus validus*, *S. fluviatillis*, *S. atrovirens*, et cetera) occurs in the air. It is most abundant around the 18th of July (Fig. 6).

Group 6—Ash Group (Family *Oleaceæ*)

Data of the first three years of this survey suggest that the usual period during which various species of Ash (*Fraxinus pennsylvanica* var. *lanceolata* and *F. nigra*) pollinate is from April 25 to May 17. During 1935, with rather cold, rainy weather, the pollination season persisted until the end of May. Highest pollen concentration (e.g., 99 pollen grains per square centimeter on May 4, 1932) is usually attained during the first week in May (Fig. 7).

Group 7.—Oak Group (Family *Fagaceæ*)

Various oaks (White Oak—*Quercus alba*, Bur Oak—*Q. macrocarpa*, Hill's Oak—*Q. ellipsoidalis*, and Red Oak—*Q. borealis*) are important hay fever causing plants during the month of May. They produce large quantities of pollen and are widespread in their distribution. Pollination extends throughout May. In 1932 a maximum concentration of 1,303 grains per sq. cm.

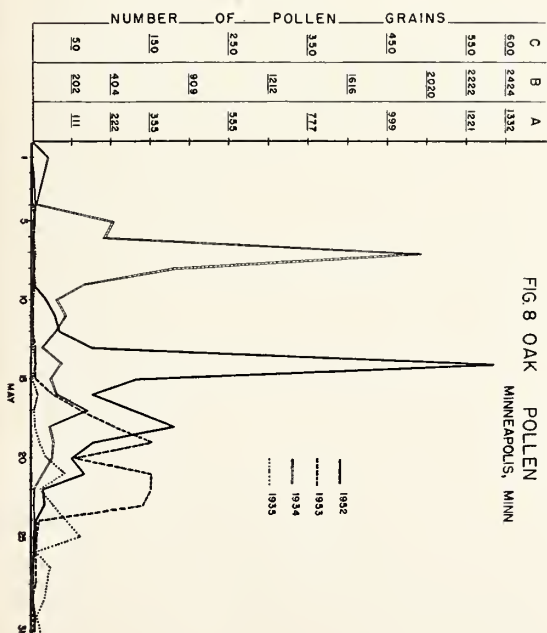
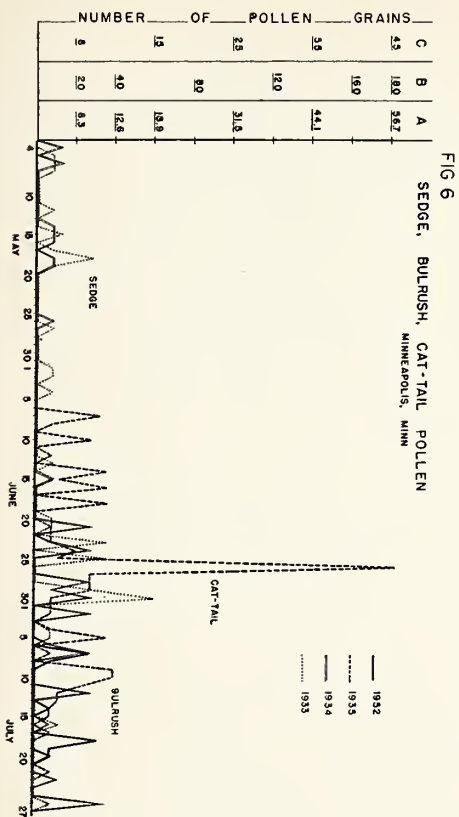
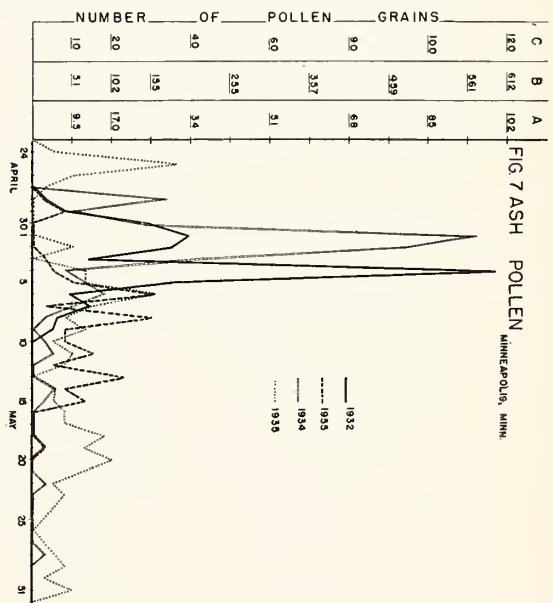
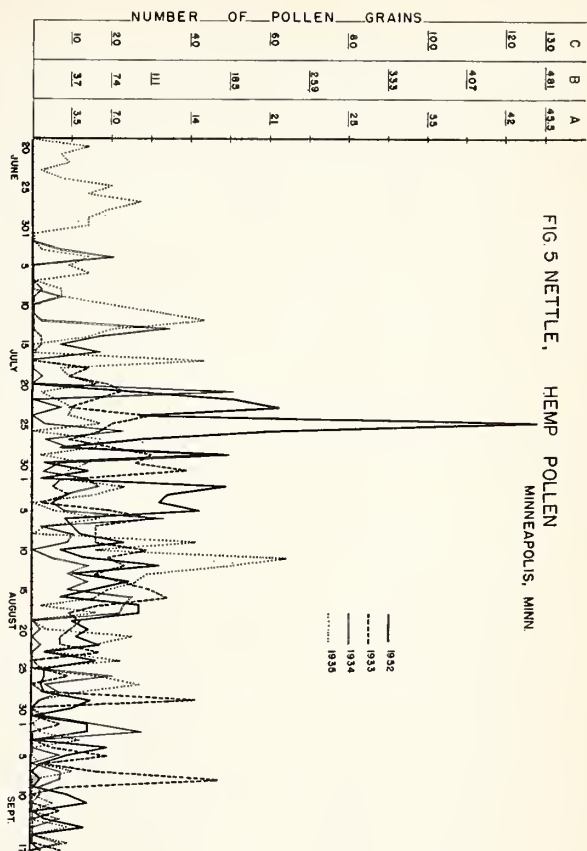
occurred on May 14. With excessively high temperatures in 1934 a peak of 1,083 pollen grains was observed on May 7, while in 1935 rather cool, rainy weather delayed the appearance of the very low peak until May 25 (Fig. 8).

Group 8.—Grass Group (Family *Gramineæ*)

During the very last days of May and pre-eminently throughout June, pollen of this very important group is predominant in the air. Seasonal maxima have occurred on June 7 (in 1932, 213 pollen grains per square centimeter) and on June 13 (in 1935, 403 pollen grains). It is during this period that the very abundant grasses such as June Grass (*Poa pratensis*), Spear Grass (*P. annua*), Hungarian Brome Grass (*Bromus inermis*), Orchard Grass (*Dactylis glomerata*), and Reed Canary Grass (*Phalaris arundinaceæ*) come into their period of most profuse flowering. Timothy (*Phleum pratense*) and Quack Grass (*Agropyron repens*) begin pollination during the last days of the month (Fig. 9).

The period during which this survey has extended has been most interesting for the tendencies especially evident in this group, and also in two others which are to be subsequently mentioned. During the period 1932 to 1934 there was a very distinct and increasing deficiency in the amount of precipitation. The devastation which this factor brought to our grassland pastures needs little emphasis. Reference to Figure 9 will show that the pollen curve for 1932 does not approach the base line until July 2, while in 1933 and 1934 the curves closely approach or coincide (note the 1934 curve) with the base line much of the time. Correlated with a distinct increase in the amount of precipitation during 1935 is a striking change in the pollen curve for this year. Indeed, the highest twenty-four-hour concentration of grass pollen ever recorded in this survey came during this year on June 13. This striking occurrence may well serve to exemplify the drought-resistance of the grasses. The total grass pollen count recorded for each of the four years in Table II indicates how markedly pollen production has varied.

Pollen of the various late-pollinating grasses (Grama or Mesquite Grass—*Bouteloua curtipendula*, *B. hirsuta*; Satin Grass—*Muhlenbergia mexicana*; Blue Stem—*Andropogon furcatus*, Sand Reed—*Calamovilfa longifolia*, et al.) are present in the air, though in rather small quan-



tities, during July, August, and September. This fact very definitely suggests that grasses must be considered as possible contributors to late summer hay fever. In the past their omission, as well as of other so-called "minor" groups, has resulted in an inadequacy of diagnosis and consequently of treatment of such cases.

Group 9.—Butternut, Walnut, Hickory Group
(Family *Juglandaceæ*)

Slides exposed during the period May 8 to June 19 have shown pollen grains of this group. The rather large grains which these trees produce (*Juglans*—39 μ in diameter, *Carya*—53 μ in diameter) have not been very abundant. On May 23, 1932, a peak of 27 pollen grains was noted, while in 1934 a peak of 38 grains occurred on May 17 (Fig. 10).

Group 10.—Plantain Group (Family *Plantaginaceæ*)

Except for observations during 1932, pollen grains of plantain (*Rib* grass—*Plantago major*, *P. Rugelii*) have been very occasional. During the last three years of the survey the number of plants occurring in the vicinity of the exposure stations has been markedly reduced by weed cutting and by extreme drought. Pollen is shed from mid-June to the first part of August with a maximum concentration being attained by the 24th of June (Fig. 11).

Group 11.—Dock, Sorrel Group (Family *Polygonaceæ*)

Included in this group are various species of Dock and Sorrel (*Rumex acetosella*, *R. mexicanus*, and *R. crispus*). The unusually high concentration noted in 1932, as compared to the very low counts recorded in the three years that followed, appears to be due to the same factors discussed in the previous group. Pale Dock (*R. mexicanus*) in the immediate vicinity of Station No. 1 was especially productive of pollen during 1932. Pollination has been noted from May 20 to July 22, with the peak of pollen production occurring between the 7th and 17th of June (Fig. 12).

Group 12.—Sweet Clover, Alfalfa Group
(Family *Leguminosæ*)

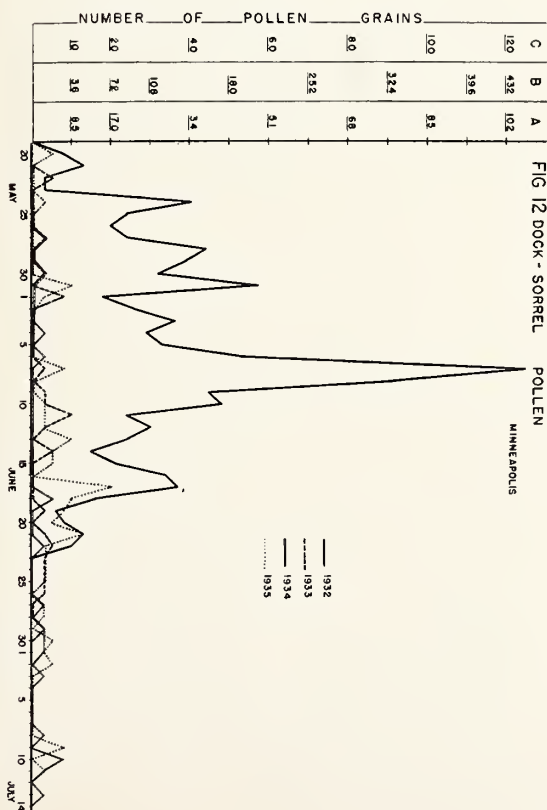
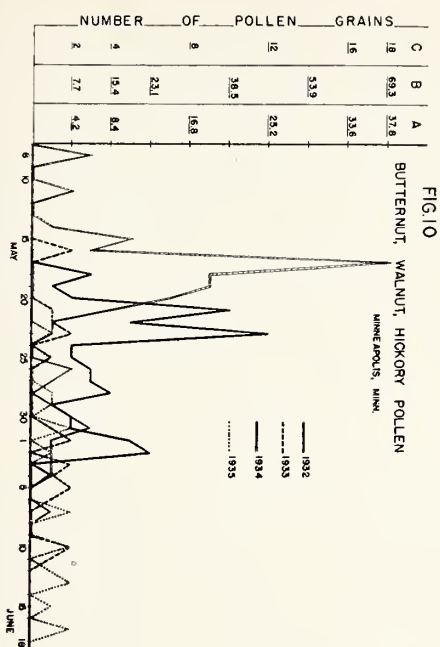
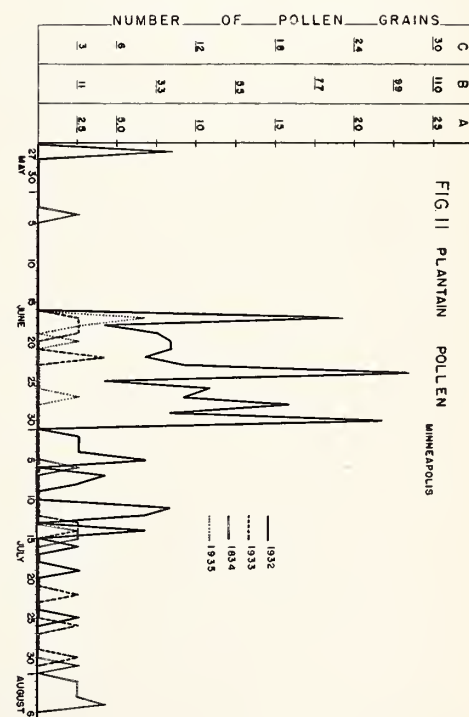
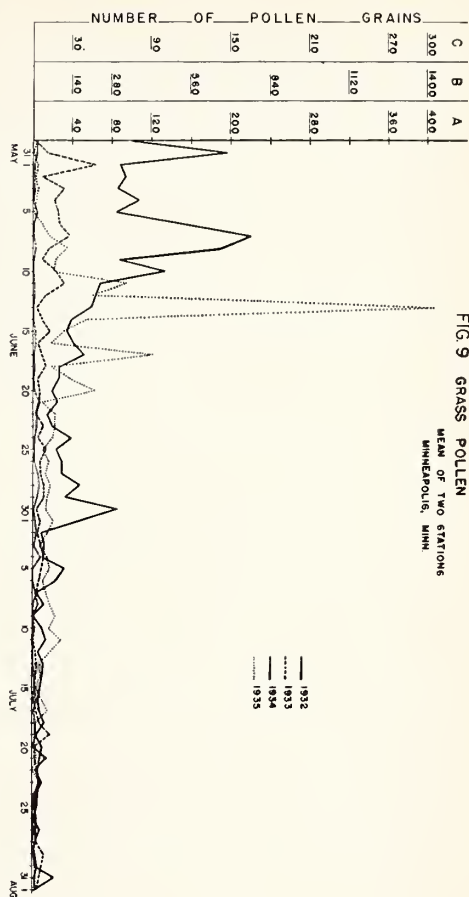
Since Sweet Clover (*Melilotus alba*, *M. officinalis*) and Alfalfa (*Medicago sativa*) are in-

sect-pollinated plants, it is somewhat strange that they should receive consideration in this communication. However, their flowers are so constructed that a mass of rather small, dry pollen (32 μ in diameter in *Melilotus*) is ejected whenever insects visit ("trip") them. This would mean that in rural regions where these plants are abundant, pollen concentration can attain sizeable proportions. On slides exposed at the two stations Sweet Clover has been observed only during 1934 and 1935, within the period June 26 to July 22. The highest concentration noted was 6 grains per square centimeter. (Fig. 14).

Group 13 and 14.—Chenopod Group (Families *Chenopodiaceæ*, *Amaranthaceæ*)

Abundant and widespread weeds of importance as causes of hay fever belong to this group. The pollen grains of the *Amaranthaceæ* are not distinguishable from the *Chenopodiaceæ* (cf. Wodehouse²⁵) and as a consequence Figure 14 gives a summary of both groups. In general, the period July 1 to September 25 represents the period during which critical concentrations are attained.

During July, Russian Thistle (*Salsola Kali* var. *tenuifolia*), Pigweed (*Amaranthus retroflexus*), and Lamb's Quarters (*Chenopodium album*) rank as being of greatest importance. Pollen of Burning Bush (*Kochia scoparia*) usually attains its greatest frequency during August. Maxima for the group have occurred as follows: On August 16 in 1933 (57 pollen grains), on August 21 in 1934 (82 pollen grains—the highest count observed during the four years), on August 29 in 1932 (59 grains), and on September 24 in 1935 (65 grains). Of the total pollen production for the season 49.1 per cent occurs during August. During 1935 high concentrations (up to 46 pollen grains) also occurred during mid-August. As with the grasses, a comparison of the yearly totals (Fig. 18) reveals a striking relationship between the amount of pollen and the lack of rainfall, though in a different manner. With increasing dryness there is noted an increase in the total amount of pollen. This fact finds explanation in the tremendous increase of Russian Thistle (*Salsola Kali* var. *tenuifolia*) in areas ordinarily occupied by grasses during years with normal rainfall.¹⁹ With an increase in precipitation during 1935 there was a decrease in total amount of Chenopod pollen which is correlated with the fact that conditions were again



suitable for other plants in addition to the Chenopods.

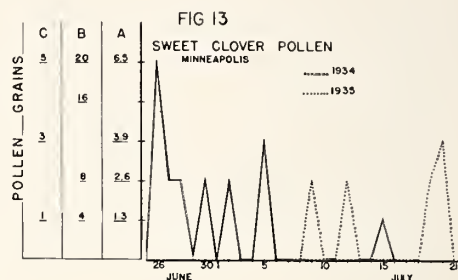
Group 15.—Wormwood Group (Family Compositæ)

While the pollen concentration of this group has never been as high as that observed for such groups as Ragweed, Chenopod and Grass, it still must be considered as a rather important element involved in many cases of late summer and fall hay fever.^{9,10,11} The various kinds of Wormwood or Sage (*Artemisia vulgaris*, *A. dracunculoides*, *A. caudata*, *A. biennis*, *A. frigida*, and *A. ludoviciana*) contribute to a rather long season of pollen production (from July 6 to October 7). Seasonal maxima may occur after the middle of September (September 17 in 1935—25 grains per square centimeter; September 23 in 1932—44 grains). This fact takes on greater etiologic importance when it is realized that 75 per cent of the cases sensitive to the Ragweed Group are also sensitive to this group. Wormwoods can thus serve to prolong the potentially troublesome season (Fig. 15).

Group 16.—Ragweed Group (Family Compositæ)

In number of cases in which it is involved, this group very definitely ranks first. Common and widespread members of this group include Common (short) Ragweed (*Ambrosia artemisiifolia* or *A. elatior*), Giant Ragweed (*A. trifida*), Western Ragweed (*A. psilostachya*), Marsh Elder (*Iva xanthifolia*), and Cocklebur (*Xanthium canadense*). Maps presenting the distribution of these throughout the state of Minnesota have been published in previous communications.^{10,11} From August 10 to September 25 the air is predominantly occupied by pollen of this group. Pollen grains have been caught on the slides as early as July 2 (1935), but no sizeable count occurs until August 10. It is worthy of note that August 15, in general, represents the first day on which a pollen concentration of over 100 grains per sq. cm. of surface is attained. This fact appears to be significantly correlated with the incidence of first marked hay fever symptoms by so many ragweed sensitive cases. A concentration of between 100 and 200 grains may be thought of as something like a threshold value. It must be added, however, that since most ragweed cases are also sensitive to at least one other group,^{8,10,24} the atmospheric concentrations of other groups

must be considered in making a detailed analysis of symptoms. For example, August 15 also represents a period of comparatively high pollen production for the Chenopod group and consequently

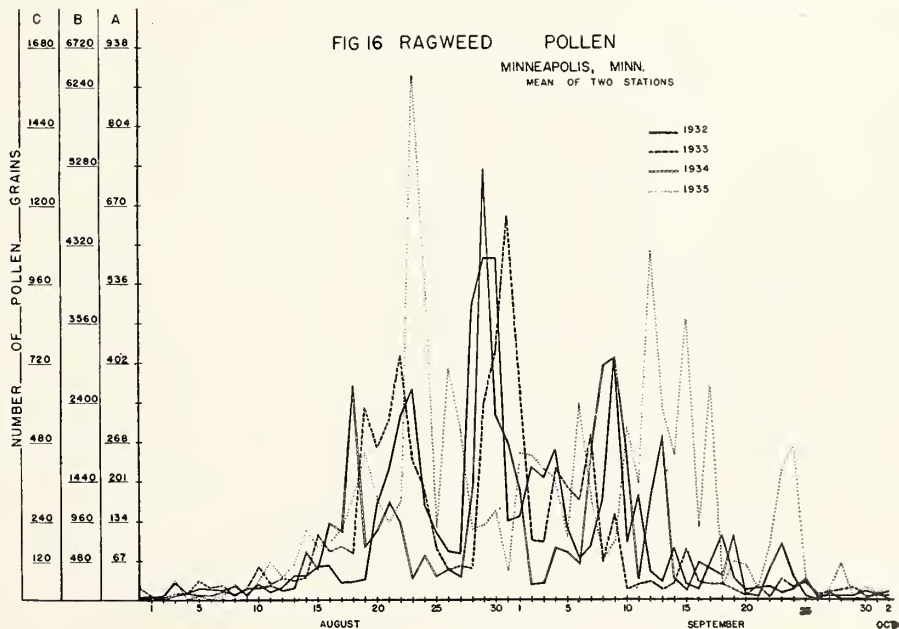
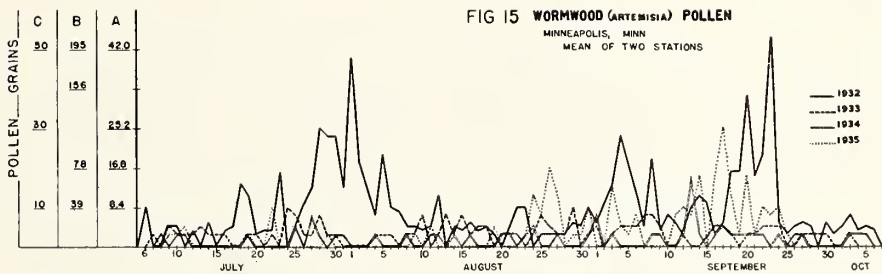
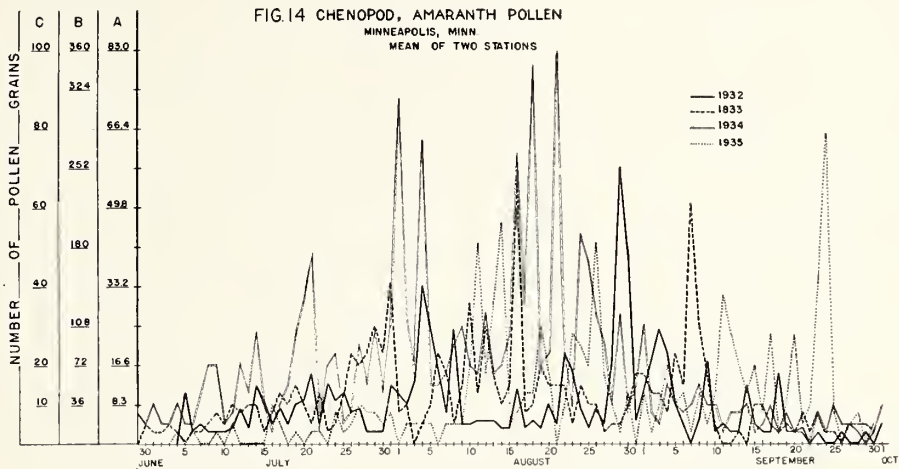


severe symptoms on this date could well be due to one or the other, or both groups. Data of the first three years on this survey have demonstrated the occurrence of three distinct critically high peaks of pollen production. The first of these, representing a concentration of approximately 378 pollen grains per square centimeter, has occurred as follows: August 18 in 1934, August 22 in 1933, and August 23 in 1932 (Fig. 16). The maximum pollen production of the season represents the second of these peaks (with an average count of 650 grains exclusive of 1935 data). For the first three years of the survey this concentration has been consistently noted between the 29th and 31st of August. The third marked peak (averaging 364 grains and thus quite similar to the first peak) has occurred on the 7th and 9th of September during the three years.

The data for 1935 indicate somewhat different conditions. High temperatures served, in general, to accelerate pollen production. On August 14 the concentration was 116 pollen grains per square centimeter, while the highest twenty-four-hour mean pollen count ever recorded in this survey (883 grains, mean of the two stations) was noted on August 23. As has been already noted, the maxima for other years occurred about one week later than this (August 29, 31). The days during the latter part of August and the first part of September were cool, and consequently the pollen count was rather low. However, strikingly high concentrations were again attained on September 6 (the period of the third peak of pollen production of the other years), and on September 12 the pollen count was way out of proportion to any experienced this late in the season. For the latter date a maximum con-

centration of 275 grains might have been suggested, but actually the count was 587 grains. In addition, unusually high concentrations were ex-

perienced on the 15th, 17th, and 24th days of this month. The last peak (258 grains) is of further etiologic interest since it came on the same day



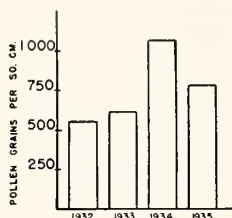
perienced on the 15th, 17th, and 24th days of this month. The last peak (258 grains) is of further etiologic interest since it came on the same day

single group during the same twenty-four-hour period is obviously an important fact where multiple sensitivity (commonly the case) is involved.

Group 17.—Miscellaneous Group

A varied assemblage of air-borne particles can be grouped under this heading. Among those consistently present are pollen grains of Pine (*Pinus Strobus*, *P. resinosa*, *P. Banksiana*, and

FIG 17 CHENOPOD POLLEN
AUGUST - SEPTEMBER TOTAL
MINNEAPOLIS, MINN



occasionally *P. montana*, *P. sylvestris*, and *P. nigra*) and Basswood (*Tilia americana*).

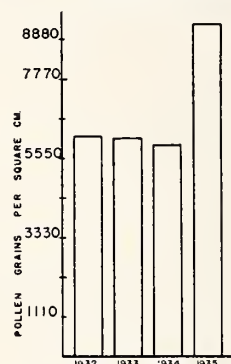
While pine pollen is most abundant during the latter part of May (average monthly total, 296 pollen grains), it is only slightly less so during June, whose average monthly total is 243. Greatest seasonal production of pollen was seen in 1933, when the annual total (820 pollen grains) was 35 per cent in excess of the average yearly total (607). The maximum twenty-four-hour count of 190 pollen grains per sq. cm. occurred during this year on May 30. It is of interest to note that occasional or "relic" pollen grains have been observed during every month of the year except January. Furthermore, the incidence of pine pollen grains could be, in many instances, related to severe atmospheric disturbances, especially with those that involved the descent of upper strata of air. Pine pollen grains, which possess bladder "wings," are quite buoyant, and Scheppegrell²¹ has noted them on slides exposed 17,000 feet above the earth during September. The relationship of pine pollen and hay fever appears to be very slight indeed for sensitivity to this group has been rarely if at all noted. Pollen of various kinds of Juniper (Cedar), which plants belong in the allied Cypress Family (*Cupressaceæ*), have been involved in some cases on record.² Very occasional grains of Juniper were noted during May of the last three years of this survey. Sporadic pollen grains of Fir (*Abies*), Spruce (*Picea*) and Tamarack (*Larix*), which are members of the Pine Family (*Pinaceæ*), also occurred on the slides.

While basswood or linden (*Tilia*) is insect-

pollinated, it possesses flowers which are favorably placed for the introduction of pollen into the air currents. It is fairly abundant, both as native and cultivated trees, and should be considered as a possible though minor factor in sensitivity. While the pollen count has never been high (maximum twenty-four-hour count—31 pollen grains), it should be noted that it occurs during a time when the total pollen content of the atmosphere is comparatively low.

During the period June 23 to 30, the unexpected occurrence of a few pollen grains of the Mustard Family (*Brassicaceæ*) was noted. The grains were of two sizes (27 μ , 37 μ), the small-

FIG 18 RAGWEED POLLEN
AUGUST - SEPTEMBER TOTAL
MINNEAPOLIS, MINN



er of which agreed with those of Tumble Mustard (*Sisymbrium altissimum*); the larger being those of common mustard (*Brassica nigra*). Investigation of patches of these common weeds demonstrated that very small quantities of pollen could be carried away from the opened flowers by strong air currents. This incidence, along with that of occasional Hop (*Humulus*), Grape (*Vitis*), Sumac (*Rhus*), Apple (*Malus*), Plum (*Prunus*), Sunflower (*Helianthus*), Aster, and unidentified *Compositæ* pollen grains, can only serve to point out some of the possible kinds of pollen which occasionally get into the air currents (Fig. 13). Hockey and Harrison¹⁴ observed apple pollen on slides placed at a distance of 135 feet from the trees. Since these pollens have not been consistently noted as being in the air, they would appear to be of only occasional clinical importance.

Discussion

The importance from a clinical standpoint of the data presented is obvious. Before a specific pollen or antigenic group of pollens can be con-

sidered to have significance even as a potential cause of hay fever (or asthma) for an individual or a group of patients, it must be established that the pollen in question is a pollutant of the atmosphere during the period when symptoms are complained of. The importance of a careful history as to period of symptoms is also apparent. A positive skin reaction has no diagnostic significance except it be shown that the pollen which induced it pollutes the atmosphere coincident with the period of symptoms of the patient. The discrepancy between skin sensitivity and clinical sensitivity is wide. It is notably greater in connection with some antigenic groups than with others, but is quite significant in all. The importance of recognizing the limitations of the skin test will be apparent from a study of Table III. This analysis of 936 consecutive cases of our own shows the number and percentage of patients reacting by skin test to each group, the number and percentage of the total who are clinically sensitive, and the percentage of those with positive skin tests who are clinically sensitive. For example, 425 (45 per cent) of the total (936 cases) exhibited positive skin tests to the Maple group, while only forty-five (4.8 per cent) of the total cases are clinically sensitive. In the case of the ragweed group (No. 16) the correlation between skin sensitivity and clinical sensitivity is higher and yet the difference is significant. Eight hundred and thirty-five (89 per cent) of the 936 cases gave positive skin tests to ragweed, but only 776 (83 per cent) of the total had symptoms during the August to frost period. Ninety-three per cent of those with positive skin test to this group of pollens are clinically sensitive. On the basis of the skin test alone the diagnosis would have been incorrect in fifty-nine (7 per cent) cases. The need for accurate data in regard to atmospheric pollution with which the period of symptoms may be correlated is obvious. The data herein presented supplies this need.

Concerning the exact amount of pollen which is clinically significant, no absolute values can be stated. It is important to recognize that this varies with different patients, dependent upon the degree of clinical sensitivity. For example, one patient sensitive to ragweed may regularly exhibit symptoms in the last few days of July, when the quantity of ragweed pollen in the air is slight, while a second does not show symptoms until

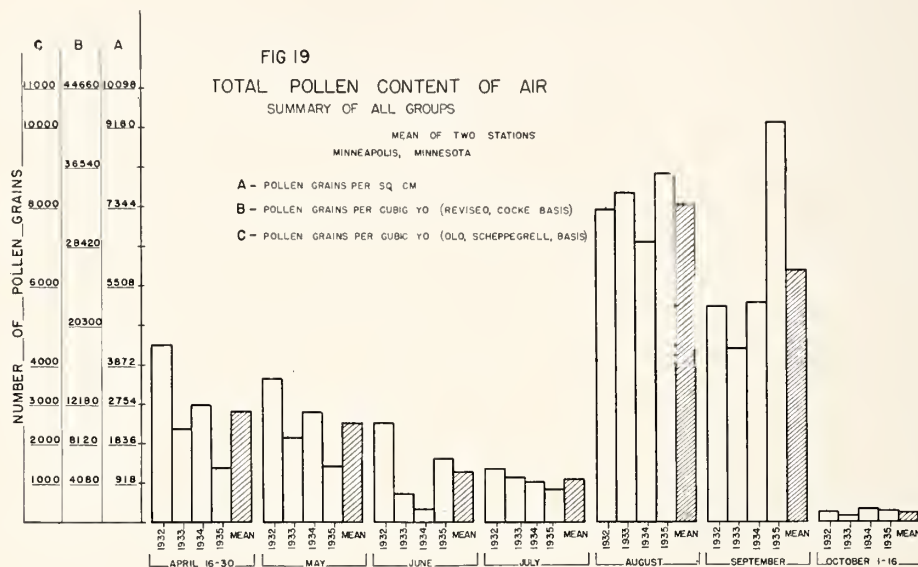
August 15 or later, when the amount of pollution is large. However, the patient clinically sensitive to a given species or antigenic group will exhibit symptoms during the period of greatest atmospheric concentration and when correlation to this extent does not exist, he must be considered as *not* clinically sensitive to the pollen in question, regardless of the fact that the skin test may be positive.

If the sixteen groups are arranged first, in order of number of cases in which they are involved, and, secondly, in order of their pollen production, it is noted that seven out of the ten most important groups from a clinical standpoint also rank among the ten most abundant pollen producers. It would appear that the total amount of irritative substance to which the patient is exposed is an important factor which enters into the problem. However, perfect agreement between number of cases and total amount of pollen is not to be expected, for such factors as potency of the pollen and duration and time of blossoming season are, in all probability, also involved.

It is reasonable to suppose that the maximum number of pollen units given in successful treatment during one season may not be specifically adjusted to conditions prevailing the next season, especially where such abnormally high peaks occur as they did on August 23, September 12, and September 24, in 1935. A maximum dosage, for example, which has given complete protection during a season in which the highest daily pollen count was 800 pollen grains per square centimeter may not be adequate for a season during which a count of 1,224 occurs. It is for this reason that in Table II the highest individual (not mean) daily count is given for each Group. These figures, together with the date of highest pollen count, serve to measure and point out in a general way the most critical period for those patients who are sensitive to the Group. Obviously, maximum dosage in treatment should be attained before this period. The dates given as covering the duration of the pollination season do not indicate the period during which pollen is present in the atmosphere for any one year, but rather mark the possible limits of the pollinating season as evidenced from this survey. The yearly total pollen production for each Group is also given in Table II, since it is indicative of a seasonal variability which possesses clinical importance, as has been already suggested. Such climatic fac-

tors as rainfall, temperature, and wind are naturally concerned with the presence of pollen in the air, and variation of these will be reflected in the pollen curves (Fig. 19). For example, de-

area to another. Elm pollen grains were observed on slides exposed during mid-March (March 14-20, 1933), which is just a month in advance of their normal period of incidence in this region.



creases in pollen concentration, which are striking when seen in graphic form, may be directly correlated with rainfall.

A rise or fall of temperature may be respectively associated with an increase or decrease in pollen concentration. This relationship appears to be related to the fact that temperature is concerned with the progress of cellular activity²² and thus with the actual production and release of pollen. Further, variable convection currents, which are related to various temperatures, are apparently important in the rise and fall of pollen grains, and thus with their incidence on the slides. It is of interest to note that Markow and Spain¹⁴ have noted a suggestive relationship between daily symptoms and temperatures. A correlation analysis^{7,19} of the data for 1932 demonstrated that highest correlation between the daily pollen count and daily temperature was seen at times during which temperature is essentially a limiting factor, i.e., during April, May, September and October (mean $r = 0.602$). During these periods daily wind velocity was not significantly related to the daily pollen counts (mean $r = 0.162$).

Throughout the text, reference has been made to pollen counts obviously related to wind direction and velocity. Winds are especially concerned with the movements of masses of pollen from one

Their presence can be related to a period of strong, south winds. At this time Elms were pollinating in the vicinity of Chicago, which would suggest that these pollen grains had been carried a distance of approximately 300 miles (Fig. 3).

Additional evidence may be cited for the widespread dispersal of pollen. Chenopod pollen grains as well as spores of *Alternaria* and *Puccinia* were caught on slides exposed aboard a boat traveling from Duluth, Minnesota, to Ft. William, Ontario. Likewise, during this same period (August 17 to 20, 1934), slides exposed at Isle Royal, Michigan, showed very occasional grains of grass, chenopod, ragweed, pine, fir, and alder pollen. Perhaps of greatest interest in this connection is Erdtman's¹³ notation of a wide variety of pollen grains midway between Iceland and Ireland. He observed pollen representing such families as birch, pine, poplar, oak, willow, basswood, nettle, chenopod, mustard, sedge, heath, and grass. Stakman, et al²³ have observed that spores and pollen grains are relatively abundant up to a height of 11,000 feet.

A series of slides exposed from August 12 to September 4, 1934, on an island in Poplar Lake are of interest since, excepting for eight days during which there was a southwest wind, no ragweed pollen was found. Poplar Lake is north of Lake Superior (Grand Marais, Cook County,

Minnesota) and ragweed does not occur in the region. On days during which ragweed and chenopod pollen occurred on the slides exposed at Poplar Lake, high pollen concentrations of these groups were also observed at stations located further south, in Duluth, Moorhead, Minneapolis, and Montevideo. Strong southerly winds would come from regions richly supplied with ragweed pollen (cf maps¹¹) and would thus serve to spread pollen-laden air beyond the limits of actual plant distribution. Similarly, winds would function in carrying pollen into regions where the plants were no longer actively pollinating, thus prolonging the troublesome season.

Summary

1. Pollen data based upon the study of atmospheric slides, exposed daily for four consecutive seasons in Minneapolis, Minnesota, are summarized under seventeen generalized group headings.

2. In certain of these groups uniformity of seasonal behavior has been noted, whereas in others marked variability has been seen. The clinical importance of this fact is obvious.

3. Important clinical aspects of these data which have been considered include:

- a. The kinds of pollen present in the atmosphere for the entire growing season.
- b. The time when a specific kind of pollen first appears in the air.
- c. The period during which clinically significant concentrations exist.
- d. The period of most critical (highest) concentration.
- e. The time at which a pollen is no longer a factor in the atmosphere.
- f. The fallacy of conclusions as to clinical sensitivity when based on skin sensitivity alone.

g. The importance of correlating the period of symptoms with data in regard to atmospheric pollution.

4. It is concluded from a brief review of existing methods of calculation that at present it is desirable to utilize the unit area basis for expressing pollen concentration.

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MANAGEMENT OF TETANUS WITH REPORT OF USE OF HYPERTHERMIA IN ONE CASE*

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IT IS a tribute to the medical and surgical practice of today that the incidence of tetanus has been so materially decreased by prophylactic procedures, such as the proper care of wounds and administration of prophylactic antitoxins. The widespread occurrence of the *Clostridium tetani* in black dirt, garden mold, manure and putrefying liquids, as well as in the excrement of horses and man, indicates that the prevention of tetanus by elimination of its bacterial source is impractical. Therefore, the problem of tetanus must be dealt with from the standpoint of prophylaxis and treatment in those cases in which the infection breaks through even the most favorable prophylactic policy.

The efficacy of strict prophylaxis is demonstrated by the number of cases of tetanus among soldiers of the United States in the World War:¹ a ratio of 0.16 cases per 1,000 cases of injury in battle—actually only thirty-six cases associated with 223,067 cases of injury. This rigid form of prophylaxis cannot be followed in civil practice, nor is it altogether desirable even if it were possible. The incidence of serum sickness and the possibility of anaphylactic shock are features which occasionally may place the overly cautious physician in an unfavorable light with some of his patients because of the discomfort of the serum reaction as well as the expense of the serum. As with any other procedure, intelligent discrimination must be employed, based on reliable histories and competent evaluation of the injury. Whenever any doubt exists regarding either the history or the wound, prophylactic measures are indicated.

The advent of alum-precipitated tetanus toxoid gives sufficient promise both in protection and ease of administration to warrant its trial and probable acceptance in a military crisis. However, for civilian practice except in especially exposed occupations, it is practically impossible to put into effect such extensive prophylaxis against tetanus that the necessity for perfecting the technique of treatment would be obviated.

I wish to mention one particular point in regard to the administration of tetanus antitoxin for prophylaxis. It has long been held that narcosis would confer protection from anaphylactic shock in administering serum to a previously sensitized individual. Not infrequently a patient will be brought into a doctor's office with numerous injuries suffered in an automobile accident. Frequently, the repair will be so extensive as to require narcosis, probably by ether inhalation. The finishing touch often will be the administration of 1,500 units of tetanus antitoxin. In a recent publication¹¹ it was pointed out that although ether narcosis substantially reduced the percentage of deaths from anaphylaxis in previously sensitized animals, yet a mortality of 23 per cent existed. This mortality indicates the risk associated with indiscriminate administration of antitoxin when given without skin tests or conjunctival tests to determine the individual's sensitivity. It is possible that the mortality would not be as high in man under the same conditions. Since we do know that it does occur, this danger can easily be avoided by the usual skin test or conjunctival test that is employed for the conscious patient.

Mortality from tetanus is sufficiently high to justify the universal fear regarding the onset of symptoms. Generally speaking, once the symptoms set in, the die is cast. Improved symptomatic treatment and the use of antitoxin, of course, have improved mortality figures somewhat but it is rather startling to note the results in 642 cases reviewed by Huntington, Thompson and Gordon⁹ in 1937, for the purpose of evaluating results of use of antitoxin. In a control group of seventy-two cases in which no antitoxin had been given the mortality was 65 per cent. The remaining 570 cases were divided into five groups according to the amount of intravenous and intraspinal antitoxin which had been given. In these groups, the mortality ranged from 58.6 to 66 per cent. In each of these cases, antitoxin had been given within twelve hours after the patient's admission to the hospital, so it may be said that this was given

*From the Section on Neurology, The Mayo Clinic, Rochester, Minnesota. Read at the seventy-first annual meeting of the Wabasha County Medical Society, Lake City, Minnesota, October 5, 1939.

as early if not earlier than antitoxin usually is administered. The comparison of the mortality in this group with that of the control group tends to support the idea that once the symptoms have set in, the odds are against cure with the present therapeutic methods.

Prognosis

Prognosis in tetanus depends on the length of the period of incubation, the rapidity of progression of symptoms once they have begun and the location of the initial infection.

In the aforementioned 642 cases, it was noted that for all cases in which the period of incubation between the initial injury and the onset of symptoms was less than seven days, mortality was 76 per cent; when the period of incubation was from eight to fourteen days, mortality was 64 per cent; when it was from fifteen to twenty-one days mortality was 40 per cent. These mortality figures were entirely without relation to the amount of antitoxin which had been administered, but since the mortality for the group in which the antitoxin was used was so similar to that for the group in which it was not used, this grouping in terms of period of incubation is probably valid from the standpoint of prognosis. The rapidity of progression of symptoms once they have become evident presents the same prognostic significance as may be noted in any infectious disease in which fulminating and subacute or chronic types may occur. In regard to prognostic importance of the location of the injury, it may simply be said that since there often appears to be a local tetanus in addition to the general reaction, an additional complication may result if the injury occurs in a critical place, such as the head, by reason of the greater accessibility to the central nervous system.

Limitations of Antitoxin in Treatment

There is a danger in medicine of placing too much faith and dependence in specific remedies with too little regard for the conditions of administration. This has been true of tetanus antitoxin and it has taken many years to learn that it is not the unqualified specific that was hoped when it was first introduced.

In the review by Huntington and his co-workers, the best results were obtained in cases in which less than 10,000 units of tetanus antitoxin

were given. In this group also the antitoxin was given intravenously and none was given intraspinally. It would appear from these studies that huge amounts of antitoxin and its intraspinal administration are contraindicated. However, it is reasonable to suppose that the patients who received smaller amounts of antitoxin were the ones who had less serious symptoms and, as we know from experience, had the best opportunity of recovering with symptomatic treatment alone. Very slight if any advantage could be noted from the use of intraspinal administration of the antitoxin. Studies by Abel and associates² which refute the blood cerebrospinal barrier idea give adequate evidence of the futility of intraspinal injection. The remarkable value of tetanus antitoxin as a prophylactic agent is too firmly fixed in our experience, however, to allow us precipitately to discontinue the use of antitoxin as a therapeutic agent. Studies by Abel and his co-workers within the past few years indicate that tetanus antitoxin plays a lifesaving rôle in treatment if it can be given early enough. If there is any one cardinal rule which should be brought before the general practitioner, it would be to give an adequate amount of tetanus antitoxin at the first sign, symptom, or, I should say, as soon as he sees a patient with symptoms.

Arbitrarily, one may say that there is little need in giving more than 100,000 units in any circumstances. This at the current cost of tetanus antitoxin amounts to \$35, certainly not prohibitive from the economic standpoint. Cables⁵ reported the case of a patient who recovered from tetanus after being given a total of 3,460,000 units of tetanus antitoxin over a period of forty-one days. The rationale behind this is highly questionable from the economic as well as the serotherapeutic standpoint. The cost of antitoxin alone in this case at the current price would be \$1,200. In addition to this the patient received each day a total of 24 c.c. of 25 per cent solution of magnesium sulfate intramuscularly for a period of twenty-five days in 2 c.c. doses. I am sure that this played a substantial, if not the major, rôle in the control and eventual recovery of this patient by effecting symptomatic relief from the muscle spasm.

Merkert¹² in an able review of the ten years' experience with tetanus in two Minneapolis hospitals concluded that there was no value in heroic doses of tetanus antitoxin.

Pathogenesis

It has long been assumed that tetanus toxin has been produced at the site of the injury after sufficient period of incubation and from there would attack the nerve trunk traveling proximally to the central nervous system, from whence the toxin would be disseminated to adjacent motor nerve cells and result in a generalized reaction. In addition to this hypothesis, there was the hypothesis that the blood-cerebrospinal barrier prohibited the larger molecule of the antitoxin from reaching the smaller molecule of the toxin which has already combined with the nervous tissues. In other words, the only effect that antitoxin could have in intravenous administration would be to neutralize the freely circulating toxin present in the blood. Hence, intraspinal administration has been entertained by many in the hope of reaching affected areas more easily in spite of lack of supportive evidence that this was true, and in spite of the difficulties attendant to such procedures.

During the past five or six years, a series of interesting studies have been performed by Abel² and his associates in regard to this particular question. By a number of substantial experiments they support their argument that tetanus toxin is blood-borne and that the action is essentially central. This was postulated by Robertson¹³ in 1916, when he concluded on the basis of his observations and his objections to current theories that the toxins pass throughout the body exclusively by the blood and lymph streams. Harvey,⁸ in 1939, emphasized the fact that muscle rigidity depends on the integrity of the motor nerve endings in the muscle, and therefore tetanus toxin exerts a peripheral action also and not simply action on the central nervous system.

The studies of Abel and his associates offer experimental evidence that the toxin is blood-borne and a blood-cerebrospinal barrier does not actually obstruct the action of antitoxin. From some of their experiments,³ with dogs, there is evidence that the antitoxin actually does attack and neutralize toxin which has supposedly been "fixed" in the nervous tissue. As might be supposed, the time element or the period of "fixation" is of primary importance in effecting a favorable antitoxin attack on the toxin.¹

By an ingenious method of bleeding and subsequent infusion of dogs who had been infected with a liberal dose of tetanus toxin, Abel and his

associates were able to recover more than 50 per cent of the toxin about ten hours after the injection of the toxin. By definite assay of the blood at this time, it could be learned that a very small, practically negligible, amount of toxin still remained freely circulating. Other dogs in the series which were given about 65,000 units of tetanus antitoxin at this time recovered without symptoms. The dogs which were not given antitoxin died from fulminating tetanus within seventy-two hours. Therefore, it was assumed that the antitoxin must have attacked the so-called fixed toxin of the nerve tissue, thus proving, first, the efficacy of antitoxin if given within sufficient time (in these cases ten hours from the injection of the toxin), secondly, that it could penetrate the so-called blood-cerebrospinal barrier since the antitoxin was given intravenously and the toxin in the blood had been washed out. This, of course, cannot be directly applied clinically since the controlled injection of toxin is a far different problem than the accidental introduction, into a wound, of tetanus spores from which the toxin has yet to be formed. These experiments give us a new hope that antitoxin may reach both the circulating and so-called fixed toxin and under proper conditions, chemical, physical, or both, a more effective neutralizing action may result. Obviously, these are extremely important facts since they open up the field of research for methods of attacking the toxin fixed in the tissue through some mediating or catalytic agency even though a considerable period has elapsed since the onset of symptoms. From the practical standpoint, prophylaxis is satisfactory and our chief concern must lie with the management of those patients who have full-blown symptoms when first seen, which, as has been already stated, is at a time when "the die is cast." There is practically no way of determining, when the patient is first seen with definite symptoms, whether his nervous tissues have a lethal or a less than lethal dose. In other words, our therapy consists more or less of routine control of symptoms plus the injection of tetanus antitoxin, the therapeutic efficacy of which we have reason to doubt on the basis of statistics I have mentioned.

The following case is offered as an example of employing a physical (thermal) agent in addition to the immunologic agent (antitoxin). So far as is known, this is the first case to be re-

ported in which artificial fever therapy has been employed in any capacity in the treatment of tetanus. No great claims are made for this method; it is presented for the speculation it may incite as well as to record the management and a good therapeutic result in an always to be feared disease.

Report of Case

The patient, a married farmer aged thirty-one years, was in good health until May 23, 1939, when he stepped on a nail and sustained a deep puncture wound in the ball of the left foot to which he paid no particular attention at the time. May 29, he felt rather sleepy, yawned most of the day and May 30, the seventh day after the injury, he complained of stiffness in his jaw. At this time, he was given 1,500 units of tetanus antitoxin, but the symptoms continued to progress and two days later, June 1, he was referred to the clinic and was admitted to the hospital.

At this time, stiffness of the jaw was graded 2 on a grading basis of 1 to 4; there was a partial risus sardonius. Rigidity of the muscles of the neck grade 2 to 3 and grade 3 of the muscles of the abdomen and back, and definite opisthotonos were present. The puncture wound in the left foot was explored but no inflammatory reaction was demonstrated. However, a small foreign body was found and sent for culture which later demonstrated green-producing streptococci and some Gram-negative bacilli which were not identified. Within two hours after admission to the hospital, the patient was given 40,000 units of tetanus antitoxin intravenously, and four hours later another 40,000 units. The patient had been tested initially for sensitivity and demonstrated no reaction to serum. This same day another 20,000 units was given intramuscularly. One and one-half grain (0.1 gm.) of pentobarbital sodium was administered every two hours as an antispasmodic. This was supplemented by 1/6 to 1/4 grain (0.01 to 0.016 gm.) of morphine sulfate when necessary to control the pain. No improvement was noted and the next day the patient was given an additional 80,000 units of tetanus antitoxin, making a total of 180,000 units, all of which had been given intravenously or intramuscularly. During this second day in the hospital, calcium gluconate was given intravenously in an attempt to obtain some relaxation of the skeletal muscles, but no objective improvement was noted.

By this time the patient's condition had progressed to the point of acute, continual pain and inability to swallow; alternate doses of 1 1/2 grain (0.1 gm.) of pentobarbital sodium and 1/4 grain (0.016 gm.) of morphine were given at least every two hours. On this date, urinalysis revealed nothing abnormal with the exception of occasional pus cells; the concentration of hemoglobin was 15.5 gm. per 100 c.c. of blood and there were 4,810,000 erythrocytes and 7,400 leukocytes per cubic millimeter of blood.

Because of the patient's critical condition, Dr. Wolt-

man suggested the use of hyperpyrexia in the hope of increasing the neutralizing effect of the antitoxin on the toxin. With the use of a general anesthetic (chloroform) Dufour and co-workers^{6,7} had noted that the efficacy of tetanus antitoxin administered intraspinally seemed to be increased. It was later advocated that ether be used as an alternate for chloroform, and although neither method gave conclusive results, each warranted consideration. Supposedly, the chemical effect of the general anesthetic was beneficial in effecting more complete toxin-antitoxin neutralization. This suggested that an empirical method, physical rather than chemical, might be used in the hope of producing some beneficial catalyzing effect through the agent of fever therapy.

Under the direction of Dr. Krusen and his associates in the Section of Physical Medicine, with special supervision by Dr. C. J. McLoughlin, the patient was given four hours of artificial fever produced by physical means, with a systemic temperature ranging between 105° and 106° F. He tolerated the fever treatment very well after the first hour and it had the definite effect of relaxing his muscles. He was given 1,000 c.c. of a solution of 5 per cent glucose in saline intravenously, in addition to about 800 c.c. of water which he took quite easily by mouth. Following the treatment his condition returned to its pre-fever status of muscular spasm in about two hours and he was put on a regimen of 1 1/2 grains (0.1 gm.) of pentobarbital sodium every two hours with 1/2 grain (0.02 gm.) of pantopon as a supplement. The next morning he had had three stools in which gross blood was demonstrated but it was decided to go ahead with the fever treatment, keeping a careful watch on him for evidence of shock. Three and a half hours of fever at a temperature of 105° F. was given. The treatment was borne as well as on the previous day and with comparable relief during the session. That evening, however, it was necessary to give the patient 2 1/2 grains (0.162 gm.) of pentobarbital sodium intravenously to put him to sleep. By the third day, a definite improvement was noted although he still had considerable pain and sedatives and hypnotics were necessary to treat these symptoms. Because of the beneficial effect of relaxation from the fever, he was placed in a pack at the end of the session of artificial fever and allowed to cool off over a period of four or five hours. This practice was continued from the second treatment throughout the rest of the course.

The stools grossly appeared normal within two days after the first evidence of gross blood on June 3. Results of benzidine tests on stools were positive for three weeks longer but results of tests with guaiac were negative, which indicated control of serious bleeding. Fortunately, no other symptoms developed to indicate a surgical abdomen. The patient was given a total of twelve sessions of fever, each of which was tolerated progressively better. These were given at approximately two-day intervals and he received the last fever treatment June 23, 1939. During this period, his fluid intake was kept up very well, largely by administration during the fever treatment, at which time he was

able to drink with comfort. Subjective improvement kept pace with objective improvement. Throughout this entire period, urine was not abnormal except for a trace of albumin, the value for hemoglobin did not go below 15.8 gm., the erythrocyte count was normal and the leukocyte count ranged from 7,400 to 10,900. Administration of pantopon was discontinued from the eleventh day in hospital and the dose of pentobarbital was decreased to about $7\frac{1}{2}$ grains (0.482 gm.) per day. June 27, the twenty-fifth day in hospital, the patient was discharged as essentially recovered, with a minimum of spasms. He returned to the clinic, July 5, with a minor complaint of some epigastric and abdominal pain. Roentgenologic examination of the stomach and esophagus was performed with negative results. An examination of the stools at this time for occult blood also gave negative results. He was given practical suggestions for diet and reassurance and sent home.

The patient returned again on July 25, 1939, with some complaint of sternal pain which had the earmarks of anxiety symptoms. These were cleared remarkably when the patient was reassured that his five-year-old daughter who had stepped on a nail about a week previous had been adequately protected with a prophylactic dose of 1,500 units of tetanus antitoxin. The patient was seen on one other occasion early in August, at which time he subjectively admitted complete recovery.

Comment

Numerous avenues of thought are opened when evaluation of this technic is attempted. On the face of this report, it borders on absurdity to make conclusions on a single case but it may be reasonable to point out a few inferences that may be drawn.

In the first place, this method must rest for the present on its merits as a means of symptomatic control of the painful spasms of tetanus which contribute, through exhaustion, the greatest problem and danger of this infection.

Relief from the terrifying spasms, even at the cost of any discomfort of the heat therapy was welcomed by the patient and throughout the entire course the patient was able to be more coöperative on smaller amounts of hypnotics than is usually experienced. In addition to these benefits, the more coöperative attitude of the patient is believed largely attributable to his relative freedom from fear and panic during the sessions of fever. The increased metabolic rate is passively achieved; that is, with minimal demands on the body. Although I hesitate to speculate on the detailed workings, it is not impossible to postulate a more effective inter-relationship of the toxin and antitoxin facilitated

by the hyperthermia. For the present, however, the symptomatic relief obtained is sufficient to warrant further trial of this method. There was no doubt of this patient's improvement by the third day of treatment, whereas the clinical course before initiation of hyperthermia was definitely downward. Prognostically, however, this case was borderline in terms of period of incubation and rapidity with which symptoms progressed. Also the initial injury was in the least dangerous location. Certainly, this emphasizes the need of a number of cases properly to evaluate the rôle of hyperthermia in tetanus, but in this case the evidence is in favor of its value.

Some rather intriguing ideas may be offered as to the *modus operandi*, such as mobilization of resistive forces and rendering the tissues, containing the toxin, more permeable, permitting increased toxin-antitoxin combination and consequent neutralization. Still another theory is that the heat may produce some of its benefits through other agents. In this regard, it is interesting to note that vitamin C (ascorbic acid) has power to inactivate tetanus toxin *in vitro*.¹⁰ Furthermore, one notes that values of ascorbic acid in blood are unusually low with fever resulting from infection, as well as low in urinary excretion during this period. In other words, in an infection the ascorbic acid demand must be greater and the destruction greater either owing to fever, the infectious agent or both. Kligler and his associates¹³ stated that vitamin C (ascorbic acid) combines with the toxin in tetanus cultures and both are destroyed, resulting in depletion of vitamin C content of blood and detoxification of the tetanus toxin. This detoxification varies with temperature, time and concentration of the broth but as a rule is more efficacious at the higher temperatures (well within the point of thermolability of vitamin C, of course). The value of ascorbic acid in prophylaxis against current infections has been recently emphasized by Smith.¹⁴ It does not appear to be borrowing too much to postulate some integral relationship among these factors such as the fever serving to speed up an ascorbic acid reaction of detoxification of the tetanus infection.

A comment would appear to be in order to explain the melena which occurred the second day of the treatment and persisted for a few days. The vitamin C level in the blood is usually about 0.5 mg. per 100 c.c. (normal 1.5 mg. per

100 c.c.) when the temperature rises to 103° F. It is possible that higher temperatures might depress this level even further and bring it close to the level at which hemorrhage may occur. Melena on this basis may have been corrected as the patient's intake of food increased after the third day, at least enough to hold a minimal level and avoid further hemorrhage.

Unfortunately, these speculations were not made until after the patient had recovered and his case was reviewed, so no estimations of the concentration of ascorbic acid were made. These clinical determinations, a procedure that can be effected with a minimum of effort, must be obtained in future cases.

Melena is not a common complication of artificial hyperpyrexia. It has occurred in only one other case at the clinic to the extent of being an actual clinical consideration. This was in a case of undulant fever and the only factors common to these two cases were that both were infections and both were treated with hyperpyrexia.

Summary and Conclusions

Review of recent literature points to the inadequacy of tetanus antitoxin as a specific therapeutic measure in a full-blown case of tetanus unless early administration of moderate amounts of the serum is possible. Large amounts of serum and its intraspinal administration appear to be contraindicated.

Management of symptoms is still of primary importance in the treatment of tetanus. The relief from muscular spasm during the period

of elevated body temperature, the lessened danger of a complicating toxic reaction by reason of smaller sedative requirement, and the coöperative emotional reaction largely owing to lessened fear and panic—all of these may be considered as benefits directly related to the hyperpyrexia.

The possible relationship of ascorbic acid and hyperpyrexia to tetanus toxin is offered as a matter for speculation. Clinical studies will be conducted with a view to proving or disproving this relationship.

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COMMUNICATED INSANITY

An Instance of Folie à Cinq

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COMMUNICATED or induced psychosis (*folie à deux*) has been defined as "a mental disorder occurring in two or more predisposed individuals who have been intimately associated with each other, the predominating feature being delusions, particularly of a paranoid type, which

are transferred from one to the other patient."¹ This condition was first described accurately by Lasègue and Falret in 1877. They used the term *folie à deux* to designate it although the condition had been mentioned previously by Berlyn in 1819, Ideler in 1838, Hoffbauer in 1846 and by Baillarger and others.¹

Stoddart stated that for such a condition to

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develop, the patients should have many interests in common, view life from similar standpoints, and should have isolated themselves from the outside world. Accordingly, the condition is most common among persons living secluded lives, and the usual subjects of the condition are parent and sibling, two or more siblings, husband and wife, or friends of the same sex who live together closely. According to Hays,⁷ it seems necessary that the individual (inductor) who is the originator of the set of ideas be a person of striking personality or of unusual mental attainments; at least, a person who is able to convince others of the validity of his beliefs. The inductor usually is considered to be an authority by the person (receptor) who accepts his ideas. The receptor must have an inherent willingness to receive the suggested or observed psychotic pattern. Craig pointed out: "that a man believes the statements of his insane relative to be true does not constitute insanity; but if he not only believes them, but acts upon the belief and regulates his life and conduct accordingly, then he too, must be adjudged to be of unsound mind." According to Bleuler, the inductor and receptor coöperate in morbid reactions to the outer world (such as querulousness, cursing, or violence) or they withdraw together, restricting contact with the world to a minimum.

Communicated insanity usually occurs as *folie à deux*, but instances of *folie à trois*, *quatre*, and *cinq* have been reported. Brussel, in reviewing the literature from 1900 to 1937, found that during this period forty-six papers had appeared on the subject, with a total of fifty-eight reports of cases. There were two instances of *folie à trois*, one of *folie à quatre*, and one of *folie à cinq*.

Tuke pointed out that we have no good corresponding English term for *folie à deux*, and that the term "communicated insanity" does not include those cases in which the disorder is not, strictly speaking, communicated, and which the French do include in *folie à deux*. The four varieties of *folie à deux* usually described^{1,3,6,7} are as follows:

1. *Folie imposée* (Lasègue and Falret³) consists of a mental disorder in which one psychotic person imposes his delusional convictions on a sane individual who is, intellectually and morally, a weaker person. It has been said that if the pair is separated, the receptor tends to discard

TABLE I. FIVE PATIENTS IN ONE FAMILY OF SEVEN ADMITTED TO HOSPITAL FOR *folie à cinq*, DATES AND AGES AT ADMISSION

Patient	Birth, date	First admission to hospital	Age on admission, years
Mother	12-27-1883	5-18-1933	50
Daughter	6-13-1913	9-17-1936	23
Daughter	2- 6-1915	5- 6-1937	22
Son	2-20-1917	5-21-1937	20
Daughter	2-24-1919	5-21-1937	19

the beliefs of the stronger personality (the inductor).

2. *Folie simultanée* (Regis³) is characterized by the simultaneous appearance of a delusion, by reciprocal influence, in predisposed associated individuals.

3. *Folie communiquée* (Marandon de Montwel³) is the condition in which the receptor accepts the delusional ideas of the inductor only after prolonged resistance, and in which psychosis persists even after the patients have been separated.

4. *Folie induite* (Lehmann³) consists of the addition of new delusions to an existing psychosis as a result of association with other patients.

Grover pointed out that in the opinion of some writers, the classification of *folie à deux* into different forms is confusing and unnecessary. According to Stoddart the simultaneous occurrence of insanity in two members of the same family as a mere coincidence does not necessarily constitute an instance of *folie à deux*; Stoddart believed that it is essential that the mental disorder of one patient be directly caused by the persuasive influence of the other.

Report of Cases

This report concerns a family of seven, in five of whom psychosis has developed. The patients were admitted to the Rochester (Minnesota) State Hospital. The parents were born in Czechoslovakia, but the five children (three daughters and two sons) were born in the U. S. A. The mother, the three daughters, and one son have become psychotic, participating in *folie à cinq*. For the orientation of the reader, the dates are given in Table I.

Case 1.—The mother apparently always had been suspicious of her husband and his association with

other women, and for several years prior to her admission to the hospital she had refused to see her few friends, believing that they really came to see her husband and not her. In March, 1933, she began to accuse her neighbors of "wickedness," to distrust her family, and to express her "hate" for her husband and for women in general. She would allow no one to enter her home. Her strange conduct progressed, so that by May, 1933 (time of admission to the hospital), she thought she was receiving messages from God and that she could feel the presence of God inside her body. She returned to her home in November, 1933, against the advice of physicians. On September 1, 1934, she was returned to the hospital with the information that she exerted a strange influence over her three daughters, in that they were entertaining the same ideas as their mother possessed. When someone came to their house, the four of them (mother and three daughters) would run upstairs so as not to be influenced by the visitor's "wickedness." The husband could do nothing with the daughters because the mother had firmly convinced them that he was wicked. She constantly warned the daughters against the father's supposed sexual advances and accused him of infidelity. She thought that at night the father would take two women to bed with him in addition to herself. She was returned to the hospital when it was found that because of her strong will and accusations, the girls remained in the house all the time, refusing to see anyone or to talk to their father. In the hospital she constantly said, "Only God and I are right and the rest of the world is bad." The condition of this patient slowly deteriorated and on September 27, 1935, she was transferred to another hospital for custodial care.

Case 2.—Daughter C, in 1933, became obviously suspicious of her father and antagonistic toward him. She soon began to voice the belief that he had been unfaithful to the mother and to accuse him of making sexual advances toward her. Her symptoms progressed so that by the time of her admission to the hospital (September 17, 1936), she thought her food was poisoned, spent her days in bed, going out only after dark, and said she saw "spirits." The social service report had said of her that "she talks in the same vein as the mother, as though memorized," and "patient dominates her two younger sisters." The situation had reached the point at which the girls refused to have anything to do with the father and stayed in their bedroom constantly. Daughter C was considered to be the "ringleader."

Case 3.—Daughter D always had appeared to be intelligent, capable, and more socially inclined than the other three siblings, in whom mental symptoms developed and who were of a shy, defensive nature. She had always loved her father and was in the habit of kissing him goodnight. In the early part of 1934, however, she ceased this practice, saying that her father only pretended to like her and that he never could be trusted. She became very sensitive and seclu-

sive, adopting a defensive attitude. She slept with C and eventually shared C's beliefs and expressed the same fears regarding the father. She accused him of practicing witchcraft. The social service report had said of her that "she is most susceptible to suggestions." She heard voices, thought her mind was being influenced and her thoughts read, and that she was being watched constantly. She spent her days in bed, and if anyone called at the house, would hide under the bed. After C went to the hospital, D took her place as "ringleader." On D's admission to the hospital on May 6, 1937, she admitted that the father had never "touched" her but she knew "what he was thinking."

Case 4.—Daughter F, who had been shy and unhappy in grade school, visited an aunt in another town, where the girl seemed lively and apparently normal. On returning home, she again became asocial. In about 1935, she became stranger, left school, and joined her sisters in their asocial way of living and in their delusional ideas. She became so antagonistic toward the father that she had to be placed in a home for girls. She thought her father had poisoned her and that he had sexual designs on her. She said that she had been drugged so as to make sexual assault on her possible. By the time of her admission to the hospital (May 21, 1937) her behavior had come to resemble that of her sisters to a startling degree.

Case 5.—Son E became actively delusional in 1935 and 1936 but no doubt had shared the sisters' false ideas before that time. On admission to the hospital (May 21, 1937) he explained his commitment by saying that his father "had it in for him" and his sisters. He accused his father of being wicked and practicing witchcraft, and stated that ghosts under his father's direction would awaken him and the sisters at night by "tapping" on them. He said that daughter C had been the first sibling to notice that the father practiced witchcraft and that she had called the attention of the others to it. Often the children discussed the various observations each had made about the father, since one of them would watch his every move while he was at home. In these conferences his actions would be "interpreted" by them. Son E believed that his father wanted to control his thoughts and actions. Five months before admission to the hospital he saw his first "vision," in a mirror before which his father had just been standing. He was seclusive, evasive and extremely untidy.

Each of the four psychotic siblings and the mother were diagnosed as having the paranoid type of schizophrenia.

The father was a hard-working, sincere, bewildered, little man who could not understand why members of his family should be so strange. He worked in a coal yard as a common laborer. His family usually received aid from welfare agencies. He had a strong sense of loyalty and

for a long time had resisted suggestions that the daughters be sent to a mental hospital. But when they began to sleep all day and play the radio all night so that he was physically worn out, he finally consented to their commitment.

At the time of the mother's first admission to the hospital (1933), son G was ten years old. He was almost fourteen years of age in May, 1937, at which time he was the only sibling remaining at home with the father. He was described by the social service worker as being a bright, likable boy who did well in school and had numerous friends. He was a Boy Scout and a member of the school police. He was devoted to his father and they took great pride in their joint cooking and housekeeping. In November, 1939, we learned that he was "getting along fine at high school."

At the present writing (November, 1939), son E has been at home since November 7, 1937. He is working with the National Youth Administration, earning twenty dollars a month. Social service follow-up work reveals him to be at present agreeable, alert, and polite, apparently reacting favorably to his work and adjusting himself well at home. He is the "housekeeper" of the home shared by his father and brother and maintains it in a degree of neatness unusual in a home cared for by men only. When interviewed, he spoke very kindly of his father, which was in direct contrast to his previous attitude.

The mother and three daughters are still hospitalized. The mother has gradually deteriorated. The daughters have received both insulin and metrazol shock therapy and are somewhat improved in that they are more efficient with the ward work and are more tidy than they had been. However, they are still delusional and lack insight.

The important part played by suggestibility in the genesis of so-called communicated psychosis is mentioned by Henderson and Gillespie and by Grover. Brill⁶ believed that an unconscious identification is at the basis of all instances of *folie à deux*. Grover's patients were suffering from schizophrenia and he stated: "The fact that schizophrenia may be precipitated by suggestion leads us to think that the relationship of schizophrenia to hysteria is closer than we have generally believed." Brill,⁶ in discussing Grover's paper, pointed out that Kraepelin spoke of the

close relationship between the two maladies and that hysterical reactions are invariably observed in the initial stages of schizophrenia. Jung, in his *Psychology of Dementia Praecox*, devoted a chapter to the parallelism between schizophrenia and hysteria (as concerns the disturbances of the emotions, characterologic abnormalities, intellectual disturbances, and stereotypy). Jung stated that in both hysteria and schizophrenia are found one or more complexes which become tenaciously fixed, but that between hysteria and schizophrenia there is no identity, but only a resemblance, of the psychologic mechanism. In schizophrenia these mechanisms reach much deeper. According to Grover schizophrenic psychosis produced by suggestion does not differ in symptoms or prognosis from that developing in the usual way.

Comment

The purpose of this presentation has been to call attention to the occurrence of communicated insanity and more specifically, to the occurrence of schizophrenia among five members of one family. On the basis of a study of these five patients, it is apparent that the psychosis each member had was similar, with identical delusional features. It would appear, as has been emphasized by other writers, that the psychosis was induced in the siblings by their unusually close contact with one another and also by the influence of the mother, who very early instilled in the children a dislike for, and fear of, the father. The youngest child, because of his age, did not come under this influence and has escaped any evidence of psychosis.

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THE MEDICAL AND SURGICAL TREATMENT OF PROSTATISM*

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DURING the past several years the treatment of prostatism has been discussed widely. A great deal has been said, alternately commendable and critical, about transurethral resection. Some physicians suggest that it is an operation devoid of all risk and that the procedure can be performed within a few minutes on any patient not yet bedridden with miraculous effect not only on vesical function but also on all other physiologic mechanisms resulting in fancy, if not in fact, in rejuvenation. Others, having tried transurethral resection, emphatically assert that there is no virtue in it and ardently champion perineal and suprapubic prostatectomy, sometimes with such fervor as to lead one to suspect that recent infrequent acquaintance with these open operations makes it difficult to recollect several obnoxious features that have been associated with such open operations in the past. The patient who has the advantage of consulting his levelheaded family physician is particularly fortunate because his needs can be sanely judged and perhaps, even though he has prostatism, treatment short of operation will bring relief. In the great majority of cases surgical measures are elective and are not emergency procedures. It seems worthwhile to review briefly, first, medical treatment, and, second, surgical alternatives.

Medical Treatment

A brief review of medical history indicates that obstruction to the vesical neck has been an affliction of man since time immemorial. The ancient physician first tried indirect methods of treatment. Drugs such as niter, asafetida, copper sulfate, camomile and aromatic oils were employed internally during the days of Hippocrates. Counterirritants applied in and near the genitalia were in vogue in the early part of the Eighteenth Century, according to Prout (1826) who employed plasters and hot fomentations to the perineum and rubbed the thighs with camphor or cantharides. Later, the attachment of leeches to the perineum or even the application of cautery to this portion of the body were methods which

physicians used because they did not recognize the real offending organ. The use of hot sitz baths and of rectal lavage with ice water later gained favor.

As medical treatment improved, more or less direct methods of attacking the prostate gland were developed. Physick devised the method of hydraulic compression of the neck of the bladder by inserting into the urethra a distensible bag made of gut which he filled with water, hoping to force apart the offending structures which had occluded the urinary passages. Heine (1874) injected iodine and ergotine into the prostate gland, hoping to cause shrinkage in its volume which might have occurred in some instances as a result of the formation of infarcts which later became fibrotic and actually were the means of reducing the size of the gland.

Later, the use of catheters which emptied the urine from the bladder and which could be left inlying for varying periods came into vogue. Some of these because of their size and structure caused ulceration which possibly resulted in canalization and finally in some reduction of the diffuse congestion in the gland. At about this time, prostatic massage through the rectal wall, irrigations of the bladder and the instillation of soothing or irritant drugs into the posterior urethra began to be used. Dilatation of the urethra with various ingenious devices which were thought to compress or depress the prostate gland were final direct methods of treatment which stopped just short of being actual surgical procedures. That many of these methods of treatment were helpful cannot be denied although one questions the wisdom of employing some of them. Certainly it seems that extreme discomfort often resulted instead of relief.

Today there is no doubt that many patients are treated by variations of these somewhat antiquated methods. In some instances, benefit accrues especially when judgment is employed in the particular selection of a method of treatment for each case. For instance, it is undoubtedly true that prostatic massage may benefit the infected prostate gland which is but little enlarged. However, when calculi are present in the gland

*From the Section on Urology, The Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 22, 1940.

or when it is of the large, benign, so-called succulent type which ordinarily causes considerable retention of urine in the bladder, only false optimism would lead one to persist with treatment by massage. The use of a catheter either intermittently or inlying for the patient who is suffering with an acutely congested prostate gland sometimes is miraculously beneficial, symptoms often being ameliorated for relatively long periods.

The injection of sclerosing agents directly into the prostate gland as a rule will cause only further discomfort. The instillation of soothing or irritant media into the bladder or posterior portion of the urethra is done at the risk of inducing or increasing infection both local and systemic and should be avoided in most instances.

An agent which can now be used but which was not available to the physician of ancient times is the roentgen ray. In the case of a large, soft, nonmalignant prostate gland which is causing incomplete retention of urine and considerable perineal and rectal distress roentgen therapy may be helpful. I have seen a number of patients whose symptoms hardly demanded surgical treatment in which great comfort was obtained by appropriate roentgen therapy. That the patient who is suffering from cancer of the prostate gland may obtain great benefit from intelligent radiation therapy is known to almost everyone. However, if one is deluded by a hope of cure and if intense radiation therapy is given, in my experience only additional suffering will result.

In the last few years the subcutaneous injection of male hormones in concentrated form has been popularized. Diminution of nocturia, slightly more forceful urination and reduction in the amount of residual urine have occurred in several cases in which I have given treatment with these preparations. However, I have been unable to confirm the enthusiastic reports of those who first described these preparations. As a matter of fact, these preparations are rather expensive and are a poor substitute for other reliable methods. I believe that, occasionally, the use of testosterone propionate is warranted especially in the case of an extremely aged man whose principal symptom is nocturia. In several such cases, the results of treatment have seemed very much worth while.

It can be stated without much fear of contradiction that medical methods of treatment must be given serious consideration in any case of

prostatism. Operations for this condition are never in the nature of an emergency. It is always desirable to reserve surgical treatment for those patients in whom nonsurgical methods have failed to effect worthwhile relief. So-called prophylactic operations done for early symptoms of prostatism cannot be condoned, and should be avoided. Great satisfaction to both physician and patient will result from adherence to the principle of deferring an operation of questionable necessity until the indications are definite.

Surgical Treatment

Ancient surgical remedies for patients afflicted with obstruction at the neck of the urinary bladder included attempts to pierce this region with long thorns, sharpened reeds and other similarly ingenious instruments which were passed into the urethra. These fell into the classification of direct methods of treatment and not long afterward, methods of ligating pedunculated portions of the prostate gland were devised. Guthrie and Civiale invented instruments with which to divide the bar at the neck of the bladder by sense of touch, there being no method then available for visualizing the region of the incision.

Surgeons then switched in the next few decades to indirect methods of attack on the prostate gland and resorted to castration (White), ligation of the vas deferens or vasectomy (Steinach) and even to ligation of both internal iliac arteries, hoping in this way to shut off the blood supply to the gland, thus causing it to become atrophic. The mortality rate from the latter procedure was frightfully high as might be expected.

What was said to be complete prostatectomy gradually came into practice at the turn of the century although incomplete prostatectomy was done through a perineal incision by Covillard as early as 1639 and by the suprapubic route, in 1832, by Amussat. Goodfellow, Fuller, Belfield, Young, Alexander and many others contributed to perfection of both the perineal and suprapubic operations. All of these authors stressed the thought that they were removing the entire prostate gland. Nevertheless, recurrences of obstruction were by no means rare and it was finally apparent that only the adenomatous tissue which lay within the true anatomical limits of the prostate gland was really enucleated by means of any of these operations. Since the bladder was inevitably opened, a period of urinary drainage

through the incision or through tubes placed within the bladder was unavoidable. Ideas of asepsis were rather sketchy or at least difficult to put in practice and much hit or miss effort was the rule in nursing attention. The great improvement in nursing methods and increased appreciation for the value of aseptic methods in the care of the bladder which accompanied the development of transurethral surgery have been infinitely valuable to the general surgeon.

Caulk, almost two decades ago, advanced the idea that relatively large amounts of prostatic tissue could be removed safely with a punch instrument. Before that time, Young had advocated the punch operation for median bar types of obstruction. Very few, if any, urologists could duplicate Caulk's results which he obtained by skill and persistence. His operations were done blindly and most surgeons felt unwilling or were not bold enough to follow his lead. Finally, a little more than a decade ago, technical advances in the fabrication of instruments resulted in the production of both lens and direct vision resectoscopes which made possible the visualization of the vesical neck during the entire course of operation. This started a revival of transurethral prostatic resection which, at the present writing, seems to have largely replaced other methods of prostatectomy.

In contrast with suprapubic prostatectomy, the performance of which is not difficult for the average surgeon, transurethral resection requires for its safe usage a long period of training during which time the surgeon must become able to recognize anatomic landmarks which are often distorted by various bizarre enlargements of the prostate gland. It is not enough to have dissected many cadavers or to have performed several hundred cystoscopies in the normal or nearly normal subject. Sufficient skill to perform safely a transurethral resection of the prostate gland can be acquired only at the expense of much thought, considerable eyestrain and tedious effort. It is an operation which the average general surgeon does not have sufficient patience to learn. Only a few will have the courage to master it in the face of all the handicaps which finally can be overcome by those fortunate enough to develop sufficient interest and opportunity.

Our experience at The Mayo Clinic with transurethral prostatic resection continues to be very favorable. Of chief interest to me is the fact that

during the past decade we have been able to perform the operation successfully and safely on many hundreds of patients who were formerly denied restoration of vesical function. Those afflicted with urinary retention and at the same time with complicating factors which prevented suprapubic prostatectomy or even sometimes cystostomy have proved, almost without exception, to be safe candidates for transurethral resection. Advanced renal disease, severe cardiac disorder, extreme age and so forth no longer are contraindications to surgical removal of the obstructing portion of the prostate gland. It is well recognized that patients more than eighty years of age are not the best risks for operation but during the year 1939 alone, we performed transurethral prostatic resection on forty-five such patients.

Of secondary interest is the fact that the period of hospitalization for patients undergoing transurethral resection continues to be much shorter than that formerly required for prostatectomy. This is important to all of us and in particular to the patient and his family. During 1939, the large majority of 1,000 patients operated on spent less than one week in the hospital. This, of course, was possible only by virtue of the fact that there is no external wound; hence, the patient need be in bed only on the day of operation. Dr. C. H. Mayo once stated that like a foundered horse, if old patients once get down it is very difficult to get them up. Each year, I realize more and more the wisdom of his sage observation.

The relief of symptoms following transurethral prostatic resection is the third point of great interest. With very few exceptions, nocturia is practically eliminated, the urinary stream returns to full size and force and general health and vigor are strikingly improved. Pyuria continues in only a small minority of cases in which great deformity of the bladder has existed for many months or years prior to operation.

It is, of course, essential that the transurethral resection be thorough and be accomplished without damage to the urethra. Postoperative stricture of the urethra can be avoided by making the proper choice of instruments, by not grasping the penis during operation and by the use of catheters of reasonable size during convalescence. If the anterior portion of the urethra is very small the resectoscope can be passed through an incision made in the perineal portion which is always

of sufficient caliber to obviate the formation of stricture.

The fourth and perhaps most attractive feature about transurethral prostatic resection is the low mortality rate following operation. During 1939, of the 1,000 patients operated on, a total of nine patients died, a mortality rate of less than 1 per cent. This was in spite of the fact that we subjected to operation many who would have been denied any other type of prostatic surgery. This minimal death rate results principally from thorough preliminary study, which allows recognition of degenerative disease that may be a potential cause of postoperative complications: expeditious operative technic which includes the restriction of the scope of operation to only what is necessary, the proper choice of anesthetic agents and the use of supportive therapy on the operating table if the need arises; meticulous attention to postoperative nursing during the entire convalescence including care of the catheter, attention to regulation of the bowels, special care to avoid fecal impaction and finally of great importance, the will of the patient to get well, an intangible factor which I believe must be important, for with it some patients survive very adverse complications. Daily visits to encourage the patient are unquestionably beneficial.

Recurrence of urinary obstruction due to regrowth of adenomatous tissue has been observed following all types of prostatectomy in a small proportion of cases. It has long been recognized that carcinoma of the prostate gland may develop years after either perineal or suprapubic enucleation and such cases have been reported by several authorities. These facts indicate the futility of referring to any form of prostatectomy as a complete operation, for the anatomical prostate gland is always left behind as the so-called surgical capsule. That portion of the gland which is ordinarily enucleated when the suprapubic or perineal procedure is used, can be, if it is deemed necessary, just as thoroughly removed by the transurethral route. However, the decrease in mortality accompanying transurethral surgery may be partly owing to avoidance of complete prostatectomy in the decrepit individual. It is certainly true in my experience that prolonged transurethral operations increase morbidity and

mortality. It seems justifiable, therefore, to use some judgment in each case and if it is deemed safer for the individual, the operation should be restricted and one should risk the reappearance of urinary obstruction. We have followed this principle in recent years and have no reason for regret. Some patients have returned after several years and have stated that obstruction to urination was again developing and almost without exception they have preferred another transurethral resection rather than enucleation. A few patients have suffered with hematuria occasionally; the bleeding arose from remnants of prostate gland left at the time of transurethral resection. This is, of course, a very disturbing symptom but it can be eliminated in almost every case by further resection.

It seems justifiable to conclude that the results of transurethral resection warrant its continuance in the future as the operative method of choice in any case of prostatism that requires surgical treatment.

Conclusions

1. Treatment for prostatism should be undertaken only after intelligent consideration of each individual case. This cannot be done by rule of thumb, or on the basis of wishful thinking.
2. Medical methods of treatment should always be tried if there is doubt concerning the necessity of surgical methods. Prophylactic operations done for very early symptoms are to be condemned.
3. When surgical treatment is definitely indicated the several methods available include suprapubic prostatectomy either in one or two stages, perineal prostatectomy and transurethral prostatic resection. Equally good functional results can be obtained by these several methods. However, the mortality rate of transurethral prostatectomy at the hands of an expert is much less than that of the other methods.
4. Judging from the history of the treatment of prostatism no surgical method which has failed to produce consistently good results survives.
5. Transurethral resection at expert hands is beyond any doubt the preferred surgical method of treatment for prostatism.

CASE REPORT

DISLOCATION OF THE HEAD OF THE FIBULA

Report of Two Cases

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TRAUMATIC dislocation of the proximal end of the normal fibula without any underlying pathology being present occurs rather infrequently. It is supposed to occur much more commonly in association with other conditions such as fractures of the leg, osteomyelitis, tumors, in amputation stumps and associated with disturbances in bone growth. A review of the literature indicates that about forty-nine cases have been reported of simple dislocation of the superior tibio-fibular articulation. Lyle in 1925 collected thirty-nine cases from the literature and added two of his own. He is one of the few individuals to have seen and reported two of these cases. Since 1925 six cases have been reported by six authors and Speed refers to one case in his textbook on "Fractures and Dislocations" published in 1935. He discusses the condition in considerable detail referring largely to Lyle's paper. Christopher's "Minor Surgery" gives a brief but complete discussion. Key and Conwell's text mentions the subject rather briefly and refers to one case, and Wilson and Cochrane merely say the condition is very rare because of the anatomy of the superior tibio fibular joint, which protects it from most injuries. Other texts such as Scudder's, Böhler's, and Jones and Lovett's make no mention of this type of dislocation.

The superior tibio fibular articulation is a true joint with a joint capsule and synovial membrane which sometimes communicates posteriorly and superiorly with the knee joint. The fibula is rather firmly attached to the tibia by the joint capsule and the anterior and posterior tibio fibular ligaments, which are further supported by the fibular collateral ligament and the anterior and posterior divisions of the attachment of the biceps tendon. The head of the fibula is further protected by lying somewhat behind the lateral condyle of the tibia. These are the reasons which are given in Wilson and Cochrane's text to explain the infrequency of dislocation of this joint.

The dislocation may occur posteriorly or anteriorly or upward. The anterior dislocations must also be displaced laterally, since the head of the fibula lies behind the lateral condyle of the tibia. The upward dislocations are said to be extremely rare and always associated with injuries about the ankle joint. The anterior dislocations have been reported about twice as frequently as the posterior. Posterior dislocations are the most serious since the four cases of chronic dislocation and the two of peroneal nerve injury all were in this group.

Pain occurs immediately and is localized to the region of the head of the fibula. The pain is usually aggravated by motion of the knee joint and the head of the fibula is tender to pressure. The leg feels best with the knee slightly flexed. Usually the patient cannot walk. Anteroposterior and lateral roentgenograms show the displacement quite clearly but the diagnosis may be readily overlooked even on careful examination of the films if one has no previous knowledge of the condition. A few cases become chronic and these patients are said to complain of a feeling of weakness of the leg.

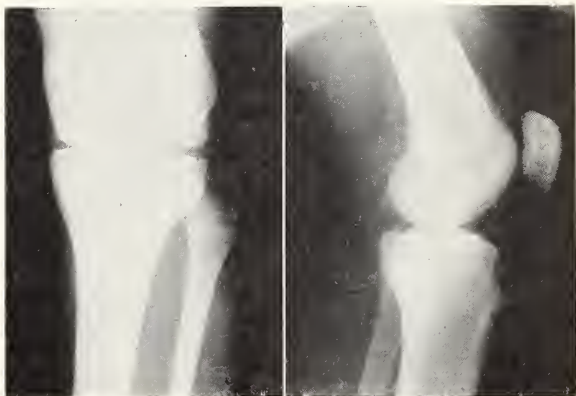


Fig. 1. In the anteroposterior projection the upper end of the fibula is seen to be situated lateral to the condyle of the tibia rather than posterior and lateral, which is normal. In the lateral view the head of the fibula lies too far anterior. The osteochondroma of the lower end of the femur on the medial side is an incidental finding.

The dislocation follows two general types of injuries. A fall on the inverted extended foot or with the leg doubled under the body is the most common type of injury. Less often the dislocation follows a direct blow on the head of the fibula. Occasionally as in one of our cases the injury is produced by a muscle pull initiated by a twisting motion.

Reduction is supposed to be accomplished quite readily by manual pressure directly on the displaced head. This should be done with the knee flexed to relax the biceps. General anesthesia has been necessary in some cases. One case reported by Small had to be pounded back with a mallet after all attempts at manipulation had failed. On the other hand what might be termed spontaneous reduction has been observed in fifteen cases. In many of the reported cases and in our two cases a loud, snapping sound was heard just as the re-

CASE REPORT

duction took place. Most authors advise fixation by a plaster cast for from four to six weeks. However, some of the cases have been completely free of symptoms from the time of reduction without any fixation. The head of the fibula may be pegged to the tibia, sutured to the tibia or an arthrodesis of the tibiofibular joint performed in cases of chronic dislocations. All of the cases requiring some type of open fixation were posterior dislocations. In this connection a case reported by Schoolfield is of considerable interest although it was not a traumatic dislocation. His patient was a seventeen-year-old boy who had bilateral relaxation of the superior tibiofibular articulation with pain in this region on the right side. The heads of the fibulae could be readily moved about and roentgenograms showed



Fig. 2. After reduction the position of the upper end of the fibula is normal.

lateral separation of the right fibula from the tibia. An arthrodesis on the right resulted in complete relief of the pain.

The prognosis is excellent. Only two cases are reported with any serious sequelae. These two cases developed a paralytic foot drop from injury to the peroneal nerve. These were also cases of posterior dislocations.

Case 1.—A sixteen-year-old boy reached upwards, backwards and to the right while standing with his feet firmly placed on the ground in order to catch a football. He felt a sudden pain in the right knee and on attempting to walk fell down. He noticed a lump on the outside of his knee. Examination a few minutes later by Dr. Macklin confirmed the presence of the lump which was due to the prominence of the laterally dislocated fibula. He was having severe pain and was unable to bear his weight on the right leg. The biceps tendon was unusually prominent and taut. There was localized tenderness over the head of the fibula. The x-rays before and after reduction are shown in Figures 1 and 2. The leg was flexed and the foot slightly inverted and direct pressure applied to the proximal end of the fibula from in front. This resulted in immediate reduction accompanied by a loud snapping sound. No anesthesia was required. A rubber sponge was applied over the fibula and held in place with an elastic bandage. The patient used crutches for three

weeks keeping the knee slightly flexed. There have been no complaints referable to the knee in the past seven months following the reduction.

Case 2.—A young woman, aged eighteen, slipped on some ice and fell. She did not remember exactly how she struck the ground but she experienced immediately a severe pain in the right knee and was unable to bear any weight on this leg. She was examined about fifteen minutes later by Dr. Hartmann. The upper end of the fibula was unusually prominent, protruding anteriorly and laterally. Roentgenograms (Fig. 3) showed the



Fig. 3. Note again the extreme lateral and anterior position of the head of the fibula indicating a dislocation.

head of the fibula to be dislocated anteriorly and laterally without any fracture accompanying the displacement. The knee was flexed, the foot dorsi-flexed and pressure applied directly to the head of the fibula causing it to slip back into normal position. A loud snapping sound was heard as the reduction took place. A cast was applied for two weeks and an elastic bandage for three more weeks before weight bearing was allowed. The patient then began to walk without any support and has had no discomfort of any kind in the knee since.

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HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN WINONA COUNTY

(Continued from August issue)

Biographies

Franklin Staples, M.D., was born in Raymond (now Casco), Cumberland County, Maine, on November 9, 1883. He received an academic education, then began the study of medicine in the office of Dr. Charles S. D. Fessenden of Portland, Maine, in 1855. He attended lectures at the medical department of Bowdoin College in 1856, and was one of the first students in the Portland School for Medical Instruction. During a period of four years, Dr. Staples was head instructor of the Old Center grammar school in Portland (since 1900, the Staples school). The year previous to his arrival in Winona, Dr. Staples spent at the College of Physicians and Surgeons in the City of New York, and, after graduating, became for a time an assistant in the Maine Medical School as demonstrator of anatomy. At the age of twenty-nine he established himself in Winona. During the first few years after his arrival he was a partner of Dr. J. D. Ford. He became well liked and highly respected in the community. Ford soon gave up practice and, in 1867, Dr. Staples formed a partnership with Dr. Wm. H. H. Richardson, a new arrival. Dr. Staples already held a leading position in his profession.

Aside from medical affairs, Dr. Staples had an interest in the religious and educational activities of the community. In 1883 he was elected superintendent of the First Congregational Sunday School and continued in that position until 1871. The school attained its highest attendance during the period of his leadership. He was also a member of the Board of Trustees and served on many of the active committees.

Dr. Staples' interest in educational affairs was manifested in his service as school director in Winona during the years 1877-1879. It is also of interest that he gave an address before the Teachers Institute as early as 1872 on the "Importance of Some Knowledge of Physiology and Chemistry as a Means of Preserving Health."

Dr. Staples was one of the founders of the Winona Preparatory Medical School, and was active as an instructor there. He was a member of the first Winona Medical Society and a charter member of the later organization of 1869. In the years 1874 and 1885, he served as president of the Winona County Medical Society. He was also a member of the State Medical Society and in 1871 became president of that organization. For many years he was a member of the State Board of Health, and held the position of president from 1889 until his death. He was elected to membership in the American Medical Association about 1870, and held offices as a member of the judicial council and as vice president. During the years 1883-1887 he held the chair of the practice of medicine in the medical department of the University of Minnesota, when the faculty of the University constituted

the medical examining board of the state. In 1883 he received an honorary degree from the Saint Louis College of Physicians and Surgeons.

Dr. Staples' writings on medical and surgical subjects were published in various scientific and professional journals. Among them are: "The Climate of the Northwest" in the *Northwestern Medical Journal* for August, 1871; his report on "The Influence of Climate on Pulmonary Diseases in Minnesota," published in the *Transactions of the American Medical Association* in 1876; and a series of published reports to the Minnesota State Medical Society included nearly every year from 1876 to 1885.

He was unusually prolific in his reports and essays. The records of the State Board of Health, of which he was a member from 1874 until 1901, contain interesting and varied reports by him in nearly every issue. Dr. Staples served also on the local Board of Health, starting in 1866 and continuing in that position for some time. During his entire professional career he was one of the most prominent physicians in Minnesota. His death occurred in 1901 in Winona.

John Steinbach was a well known ophthalmologist who practiced medicine at Winona for twenty-nine years, coming there in 1891. He died at his home in Winona, at the age of sixty-four years, on April 28, 1920.

Hiram Stevens was a Winona County physician about 1864.

Darwin Adelbert Stewart was born at Croyden, New Hampshire, on April 5, 1842. At the age of five years he was taken by his parents to Montpelier, Vermont, where he spent the days of his boyhood. After receiving the usual preparatory education, he entered Kimball Union College at Meriden, New Hampshire, and graduated in 1863. Soon afterward he visited the western part of Minnesota and "laid" two land warrants which his father had purchased from Revolutionary veterans. As the result of this trip, there was laid out the village of Stewart, in McLeod County. While in Minnesota, Mr. Stewart taught school in the village of Plainview in the winter of 1863-1864. He then returned East and entered the Eastman Business College at Poughkeepsie, New York. In the following year he became an instructor in a similar institution in New Haven, Connecticut. In 1867 he entered the medical department of Columbia University in the City of New York. Two years later he was graduated, and then took a year's course in the old New York Hospital, now known as the Roosevelt Hospital. Immediately upon the expiration of his term as an interne in this hospital, he came west and on January 1, 1870, selected Winona as his permanent location. He opened an office and soon built up a large practice. In 1871 he became a member of the Winona County Medical Society, and served as president in 1875. He was elected to membership in the Minnesota State Medical Society in 1872. For five years, from 1875 to 1879, he served as city physician. During the seventies he was also active as an instructor in the Winona Preparatory Medical School. He served for ten years as County Coroner; and later in life he held the office of president of the school board, and as mayor of Winona (1902-1903). Dr. Stewart was local physician for the Chicago, Milwaukee, and St. Paul railroad for more than thirty years, and for the Green Bay and Western railroad for nearly forty years. He was prominent in both the Elks and Masonic fraternities.

Dr. Stewart died at St. Barnabas Hospital in Minneapolis on November 30, 1914, at the age of sixty-nine.

T. Stringer was a physician and surgeon at Utica about 1878-1879.

Absalom Boyles Stuart, M.D., was born at Williamsburg, Pennsylvania, August 27, 1830. He attended Lewisburg University and received his degree of M.D. from the Berkshire Medical College in 1856. After receiving his degree, he began practice in West Hampton, Massachusetts. In 1858 he moved to Macomb, Illinois. In August, 1861, he was commissioned assistant surgeon of the Tenth Missouri Infantry, U.S.V., and was appointed superintendent, on behalf of the Federal Government, of the hospitals established at Iuka, Mississippi, by a cartel between General Rosecrans and General Price. In April, 1863, he was promoted to be surgeon of the First Alabama Cavalry (white), U.S.V. In January, 1864, he resigned from the army. In March, 1866, he graduated from Bellevue Hospital Medical College, and soon thereafter took up the practice of his profession in Winona. While engaged in general practice, he gave especial attention to surgery, and had charge of a number of notable cases. He was a member of the Massachusetts State Medical Association, a charter member of the Winona County Medical Society, and president of that organization in 1872. He was also a member of the Minnesota State Medical Society in 1870 and served as vice president in 1874 and 1876. In 1873 he was secretary of the State Medicine and Public Hygiene Section of the American Medical Association. He was instrumental in securing the establishment of the Minnesota State Board of Health in 1872. That year he was elected teacher of surgery in the Winona Preparatory Medical School, and in 1873 he became president of the institution. It is interesting to note that he served on a committee of the State Board of Health in 1872 to inquire into methods of teaching hygiene in the normal schools.

In 1876 Dr. Stuart was a delegate to the International Medical Congress at Philadelphia. Some of his more important professional publications were: Annual Report, Minnesota State Board of Health for 1873 and "Report of a Case of Supposed Separation of the Upper Epiphysis of the Radius," in the Transactions of the Minnesota State Medical Society, 1876.

About 1878, Dr. Stuart moved to Santa Barbara, California, where he practiced for a short time. After a few years, he moved to Santa Rosa, in the same state (1881), where he died on July 27, 1887.

Dr. Stuart was married in 1857 to Anabel, daughter of Hugh F. McGaughey, then of Doddsville, Illinois. She received her early medical education in the Woman's Medical College of Philadelphia, and graduated from the Medical College of the Pacific, San Francisco, in 1878. Mrs. Stuart practiced successfully for many years in Santa Rosa.

J. H. Sudduth, physician, surgeon, and druggist, came to Saint Charles about 1863. About 1869-1870 he and Dr. Slagle practiced as partners. From 1872 to 1876, approximately, Dr. Sudduth and Dr. Bibbins were partners in a drug business. In 1877 Dr. Sudduth took his brother, H. H. Sudduth, into the drug business with him. Dr. Sudduth probably practiced medicine at the same time. In 1878-1879 Sudduth and Boyd engaged in the drug business together. A notice of 1883 states that Dr. Sudduth had resumed the prac-

tice of medicine in Saint Charles. Dr. Sudduth died in Saint Charles, November 24, 1884, at the age of seventy-one.

T. J. Swan was listed as a Winona County doctor in 1865.

Jerome B. Tamblin, M.D., came to Winona in 1867 and published the following card upon his arrival.

JEROME B. TAMBLIN, M.D.

Physician and Surgeon

Recently of New York, has had twelve years' experience as a practitioner. Particular attention given to the treatment of diseases of women and children. Calls in city and country promptly attended to.—Office in Ford's New Brick Block, Second Street, Winona, Minn., Residence 159 3rd Street.

In 1869, Dr. Tamblin moved to Saint Charles to practice and to engage in the drug business with Dr. Guthrie. It was during that year that the Winona County Medical Society, of which he was a charter member, was organized. In 1871 he became a member of the State Medical Society. During the term of his practice in Saint Charles, Dr. Tamblin was often called out of town to attend cases at Elba, Utica, and the surrounding country. He was always an active politician in the county. In 1882 he moved to Lanesboro, Minnesota, and in 1885 he was living at Lincoln, Nebraska.

D. L. Taylor was listed as a Winona County doctor in 1865.

Rudolph C. Teschan graduated from the University of Basle and from the University of Michigan. Before coming to Winona in 1882, he had occupied the position of Inspector of the National Board of Health. He came to Winona from Detroit, Michigan, to succeed Dr. Lessing, who went to Philadelphia to spend the winter. In 1885 he became a member of the Winona County Medical Society and of the Minnesota State Medical Society. Aside from his practice, Dr. Teschan was vice president of the Winona "Adler" publishing company, organized in 1885.

J. Thomas was a doctor in Minnesota City in 1857.

J. Thompson, physician, lived at Rollingsstone in 1860 and died there in 1861. Possibly he is confused with Dr. Thomas.

Isaac W. Timmons, homeopathic physician, came to Winona about 1875. About 1878 he moved to Chatfield, but returned to Winona to practice in October, 1884.

(To be continued in October issue)

President's Letter

CALL TO SERVICE

THE draft act may or may not be passed when this issue of MINNESOTA MEDICINE is off the press; but the ground work will have been laid, in any case for medical participation in draft board activities.

The contribution of medicine to the defense of the nation was never confined exclusively to service for the fighting men, of course. But the importance attached to physical fitness and to the careful selection of men for military services has grown to large scale proportions in this new effort to prepare our nation.

Proceeding from lessons learned in the last war, the draft boards of 1940—if they should indeed be set up—will require far more careful sifting of enrollees than ever before. And no time is being lost by physicians in Minnesota in providing, beforehand, the machinery that will be ready when Congress and the President say the word.

There will be 122 draft boards in Minnesota with three members on each board, officers of the association were informed at a recent conference. One examining physician will serve with each board and his rate of pay will be \$1.00 an hour for each hour he is actually engaged in making physical examinations for the board but not to exceed \$10.00 a day.

Plans call for thirteen medical advisory boards of specialists to whom draftees will be referred by these boards. These boards will be located in Minneapolis, St. Paul, Rochester, St. Cloud, Mankato, Willmar, Crookston, Bemidji and Duluth, and the members will serve without pay.

All appointees must have indicated their willingness to serve. They must be over thirty-one years of age and they must not be officers in the reserve.

Selection will be made from recommendations by presidents and secretaries of county medical societies and councilors of their respective districts.

Two or three names will be submitted for each position according to present plans and they will be submitted in turn to the Governor. Appointments will be made by the President from recommendations by the Governor.

The importance of securing well qualified physicians for these appointments goes without saying. Also the importance of speed in selecting them in case the draft is passed.

Here is another avenue of service for organized medicine, another chance for the Minnesota State Medical Association to show responsible state officials its effectiveness as an instrument of public service.

Instructions will be mailed to county officers immediately as they are received from the Governor and it is certainly not out of place, even in advance of action by the Congress, to urge promptness upon our society officials in answering that call.

B. S. ADAMS, President
Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL
ASSOCIATION

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BUSINESS MANAGER

J. R. BRUCE

Volume 23 SEPTEMBER 1940 Number 9

SULFATHIAZOLE

THE chemical products sulfanilamide and sulfapyridine have proven to be phenomenally effective in various types of bacterial infections. Their use has been somewhat limited by their toxicity. To maintain proper dosage and avoid toxic effects, certain laboratory procedures, not always easily accessible, are necessary.

In an effort to maintain the very useful action of these products and at the same time reduce the risks, some new variants have been evolved. Sulfamethylthiazole and sulfamidathiazole have undergone extensive clinical trials, in various types of infections, to determine their usefulness, dosage and dangers. These trials have been carried on under the direction of the Federal Food and Drug Commission.

Sulfamethylthiazole has proved to be effective in the control of streptococcal, pneumococcal, and staphylococcal infections. However, in effective dosage it has also shown a tendency to cause toxic neuritis, of an extent and permanency not yet fully determined. Sulfathiazole, now released and on the market, has proved effective in the control of the same types of bacterial infections; and has shown a much lower toxicity. Its rate of excretion appears to be rapid and much more uniform than that of sulfapyradine. It is eliminated principally through the intestinal tract, only about 33 per cent passing through the kidneys. Its necessary level of concentration in the blood for effective action is lower than that of either sulfanilamide or sulfapyradine.

It is tasteless and easy to handle, and has much less tendency to disturb digestion. It has not shown the tendency of sulfanilamide to cause cyanosis; nor the tendency of sulfapyradine to acetylate and disturb the kidneys. Apparently sulfathiazole is a much safer chemical to employ than sulfanilamide or sulfapyradine, and therefore can have a much wider use.

There is a class of patients partially disabled by chronic bacterial infections in whom it is highly desirable that some form of chemotherapy be used. In the last six months I have employed sulfathiazole in the treatment of a group of twenty-five such private patients. Long continued bacterial infections of the urinary tract proved suitable for the purpose of study, both because of the ambulatory nature of many of them, and because of the comparative ease of checking the effects of the drug.

The bacterial agent was found, and blood and urine cultures made before any drug was given. The blood level of the drug was determined in forty-eight hours, and cultures again made of the catheterized urine. Frequent blood counts were had and any untoward symptoms noted. When cultures became negative, the dosage was immediately reduced sharply, and continued laboratory and clinical evidence gathered.

The first cases were chronic kidney infections in which the agent was *Streptococcus fecalis*. Uniformly rapid and satisfactory control with

no undesirable side effects was attained in these urinary infections; and the drug was then applied in pneumococcal and staphylococcal infections. Again the result was favorable comparing well with previous experience with sulfanilamide and sulfapyradine.

From this experience I am able to predicate that the effective sulfathiazole level for bacteriostatic control of urinary infections with *Streptococcus fecalis* and *Bacillus coli* is an initial blood level of about 4 mg. per centum of blood. In adults this can be reached by a daily dose of 6 to 8 grams for forty-eight hours, followed by a maintenance dose of 3 to 4 grams for two or three days; and then dropped to 1 or 2 grams daily at which dosage the blood level is less than 1 mg. per centum.

In pneumococcal infection the blood level of sulfathiazole should be around 6 mg. per centum, and can be rapidly reached by a daily dosage of 8 to 10 grams. If, after this level is maintained twenty-four hours, clinical improvement is not evident, the type serum should be employed in moderate dosage. The drug should be reduced immediately to one-half the initial dosage, and further reduced to 1 to 2 grams per day when the temperature has returned to normal. Initial dosage for children under twenty-five kilos in weight should be based on 1.5 to 2 mg. of sulfathiazole per kilo.

Ample water should be provided with each dose of sulfathiazole; the tablets should be either well chewed or broken up before administration. The minimum daily dosage should be continued for a week or so after the acute symptoms have subsided.

Recurrences in both acute and chronic infections are common if the drug is stopped too soon, but the bacteriostatic action is maintained by dosage of 1 to 2 grams daily after the initial necessary blood level has been maintained for forty-eight hours.

With any drug of this chemical group there will be individuals who react badly. The dosage must therefore be as carefully controlled with sulfathiazole as with sulfanilamide or sulfapyradine. However, the present evidence is that sulfathiazole is an active bacteriostatic agent in a wide group of bacterial infections, and that it can be effectively employed with less chance of disturbance of the blood, kidneys, or the digestive system than occurs with sulfanilamide

or sulfapyridine; and that its desirable action can be attained with blood levels much lower than either of them.

W. B. ROBERTS.

THE SULKOWITCH TEST FOR EXCRETION OF CALCIUM

THE medical profession is indebted to the group of workers in the Massachusetts General Hospital who have added so much to our knowledge of metabolism of calcium. It is this group which has taught us methods for the early diagnosis of hyperparathyroidism, thus permitting the early removal of hyperfunctioning parathyroid glands.⁴ These workers also have performed detailed studies of cases of parathyroid insufficiency and have discussed the best methods for raising the concentration of calcium in the blood.⁵ They have discussed the formation of renal stones¹ and have outlined a nonsurgical treatment for certain types of renal and vesical stones.⁶ Moreover, they have described an entirely new syndrome, which is being referred to as "Albright's syndrome."³

One of the greatest contributions of this group has been to present to the medical profession a simple, effective and inexpensive method of observing excretion of calcium in the urine. The test can be performed by any physician, without the use of extensive or expensive laboratory facilities. The method consists simply in adding the reagent to an equal amount of urine. The reagent, named "the Sulkowitch reagent," is described in a brief article by Albright.² He stated, "The Sulkowitch reagent* is a solution containing oxalate radicles buffered at such a pH that when equal amounts of the reagent are added to urine the calcium will almost immediately come down as a fine white precipitate of calcium oxalate. If there is no precipitate there is no calcium, and the serum calcium level is probably from 5 to 7.5 mg. per hundred cubic centimeters. If there is a fine white cloud, there is a moderate amount of calcium and the level of calcium in the serum is in the satisfactory range. If the precipitate looks like milk, the danger of hypercalcemia is present."

*Two and five tenths Gm. of oxalic acid, 2.5 Gm. of ammonium oxalate and 5 c.c. of glacial acetic acid are dissolved in distilled water and made up to a volume of 150 c.c. (Barney, J. D., and Sulkowitch, H. W.: Progress in the Management of Urinary Calculi, Jour. Urol., 37:746, (June) 1937.)

This test is valuable for determining excessive excretion of calcium in the urine in cases of hyperparathyroidism. It is of equal value in regulating the treatment of parathyroid insufficiency. In this connection Albright concluded by stating:

"The patient does his own tests and modifies the dose according to the results. I usually prescribe about 3 c.c. of dihydrotachysterol a day until calcium appears in the urine and then I drop the dosage to a maintenance level of about 1 c.c. from three to five times a week.

"This discussion has been slightly oversimplified. There are a few 'ifs' and 'buts' that must be added. Occasionally a normal person who happens to be on a very low calcium diet will show in a single specimen of urine practically no calcium. Almost any normal person shortly after drinking a large amount of milk will show an excess of calcium in the urine. Since one keeps one's patients with hypoparathyroidism on a high calcium diet, one would expect them always to show hypercalciuria if their levels of serum calcium are normal. It thus turns out that if the dosage is reduced when a large amount of calcium appears in the urine the blood calcium will be kept at a slightly subnormal level. Such is the case. This is probably all the better, since it further guards against hypercalcemia, and slight hypocalcemia is not deleterious."

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—E. H. RYNEARSON.

THE FIRST CHOLECYSTECTOMY IN AMERICA

THE first successful cholecystectomy in Minnesota, in fact, the first in this country, was performed on September 24, 1886, at St. Joseph's Hospital, Saint Paul, Minnesota, by Dr. Justus Ohage. It seems that the anniversary of this important surgical milestone should not pass unnoticed.

Langenbuch, in 1882, was the first to remove successfully the human gallbladder. The cholecystectomy by Doctor Ohage was the twenty-second case reported in the medical literature.

At that time cholecystotomy was considered to be the procedure of choice in disease of the gallbladder; Lawson Tait described cholecystectomy as being "intrinsically absurd." At that, cholecystotomy was not performed very frequently. Only eight years before, in June, 1878, the first successful cholecystotomy had been performed by Kocher. Up to 1886, there had been only fifty cases reported in the literature with thirty-nine recoveries and eleven deaths, a mortality of 22 per cent.

Doctor Ohage's patient was a white woman, thirty-five years old, who had had attacks of gallstone colic for three months. In the right hypochondriac region there was an oblong tumor that could be felt. It was freely movable and painful to touch and its lower pole reached almost to the iliac fossa. On the morning of the operation there was a feeling that something "daring" was to be performed. Certain physicians had warned Doctor Ohage that he might be indicted for manslaughter if the operation should fail. Doctor Ohage was assisted by Doctors Nelson, Schulin, Dedolp, Jr., Denny, and the house surgeon, Doctor Welsh. Ether anesthesia was used. The operation was performed under "strict antiseptic precautions, no spray." Doctor Ohage, like many surgeons of that period, believed more in antiseptic than aseptic surgery. The washing of the peritoneum and viscera with 1:2000 corrosive sublimate solution at the end of an operation was a common practice as well as the dusting of iodoform over the wound after closing the abdominal layers. Sisters Christina of St. Joseph's Hospital, who remembers the period well, says that surgeons upon closing the abdominal wound often applied a layer of borated or iodoform gauze on the skin and then a dressing of non-sterilized absorbent cotton. The use of the carbolic acid spray seemed to have enjoyed but brief popularity in Minnesota, and its use was on the wane at the time of this operation.

The incision was a vertical one, about six inches long, on the outer border of the right rectus muscle. Upon opening the peritoneal cavity, a hydrops of the gallbladder was found. There was a stone in the cystic duct which was manipulated back into the gallbladder. After the cystic duct was ligated with carbolized silk, the base of the gallbladder was incised and more than a pint of mucoserous fluid evacuated. The cystic duct was then cut close to the ligature with a cautery,

and the gallbladder removed. It contained one hundred and thirty-five stones. After washing the liver and the bowels with a 1:2000 corrosive sublimate solution, the whole wound was closed with deep and superficial silk sutures. Iodoform was dusted freely over the wound, a large pad of absorbent cotton applied and held in situ by a binder. It is interesting that no drainage tube was used.

The patient made an uneventful recovery. Her temperature never rose to over 101 degrees, nor her pulse over 90 beats per minute. A dose of calomel was given on the fifth day to relieve constipation. On the eighth day, the dressing was removed for the first time. There was no drainage on the dressing. All the sutures were removed. The patient was discharged from the hospital on the thirteenth day after operation. She remained well until her death nine years ago.

In his paper written in the *Medical News* for February 19, 1887, Doctor Ohage discussed somewhat his indications for cholecystotomy and cholecystectomy. "In old decrepit subjects where the disease (cholelithiasis) is probably ended, et cetera," "he favored cholecystotomy." In healthy young subjects where the stone formation is probably not yet ended, et cetera," he favored cholecystectomy. In later years, however, he extended his indications for cholecystectomy to even old subjects.

Those who knew Doctor Ohage best say that he was of a modest, self-effacing nature. In 1912, Dr. William Mayo asked Dr. J. Ohage, Jr., "Did you know that your father was the first to perform a cholecystectomy successfully in this country?" It was only after this that the senior doctor told his son about the operation. Probably very few know that Doctor Ohage ran away from home in Germany at the age of fourteen years, and came to this country. He fought with the Union Army during the Civil War. After several years as a sailor and working as a medical assistant on a railroad, he was graduated in 1880, from the University of Missouri Medical School at Columbia. His postgraduate work was obtained under Esmarch, Virchow, Bernard von Langenbeck and Keyes. Returning to this country he practiced in St. Paul, Minnesota, where he was known not only as a skilled surgeon, but also as

an efficient health officer and lover of the out-of-doors. He continued in his practice until a year before his death in 1935.

The "first" operation or surgical procedure is often a matter of chance. However, the successful cholecystectomy performed by Doctor Ohage was not a matter of luck or chance, but was the result of a thorough surgical background. Minnesota has been fortunate in always having had good medical men like Doctor Ohage. His achievement adds luster to the medical history of this state.

CHARLES E. REA

DESOXYCORTICOSTERONE

The Council on Pharmacy and Chemistry reports that it has had under consideration for some time preparations of the adrenal cortex. When desoxycorticosterone was synthesized and marketed as an acetate for clinical use, it was anticipated that much of the inaccuracy and unreliability of adrenal cortex therapy associated with the use of extracts of the adrenal cortex gland would be eliminated, since the administration of this potent steroid on a basis of dosage by weight appeared to offer advantage over the administration of adrenal cortex extracts, which are rather unsatisfactorily assayed on laboratory animals. The early reports of dramatic clinical success in the treatment of Addison's disease were held most promising. Soon after desoxycorticosterone was employed in Addison's disease, the Council learned of the occurrence of significant untoward reactions and, in several cases, actual fatalities. One of the most striking effects obtained with this substance was hypertension, which in some cases resulted in cardiac failure and death. There has been sufficient confirmation of these results to warn against the indiscriminate and excessive use of this substance in routine therapy. Adequate evidence of another sort has also led to the conclusion that desoxycorticosterone acetate does not possess all the properties of the adrenal cortex gland and that the synthetic principle, therefore, does not furnish complete replacement therapy. In view of the possible widespread use of desoxycorticosterone acetate, the Council requested Dr. Edgar S. Gordon of the University of Wisconsin Medical School to prepare a review of the physiologic and clinical data obtained with this substance up to the present time. The Council authorized publication of Dr. Gordon's article "The Use of Desoxycorticosterone and Its Esters in the Treatment of Addison's Disease" and it appears as a part of the Council's report. (J.A.M.A., June 29, 1940, p. 2549.)

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

DEFENSE RECORD FOR MINNESOTA

Minnesota ranks second among the eight states of the Seventh Army Corps Area in the number of medical preparedness questionnaires so far returned to the American Medical Association headquarters.

This record, as reported recently by Dr. R. W. Fouts of Omaha to Chairman F. L. Smith of Minnesota's Committee on Medical Preparedness, is regarded as highly satisfactory. Top rank now belongs to Nebraska, however, with South Dakota, North Dakota, Iowa, Kansas, Missouri and Arkansas following Minnesota in the order listed. The entire Corps Area is among the top five in the United States and the average is 11.3 per cent above the rest of the country.

Physicians of Minnesota are being congratulated by defense authorities upon the promptness and wholeheartedness of their coöperation, therefore, although a considerable number still remain to be heard from. The actual number of cards mailed to the State Office as evidence that the obligation has been fulfilled was 1667 when this issue went to press.

A special appeal is accordingly being made to the others by officers of the association as well as by the committee in charge to supply the information requested and to send their cards to state headquarters at once. Minnesota will not remain at its present position long unless all remaining questionnaires are returned.

In the new organization for defense the Surgeon General of the Army depends wholly upon American Medical Association lists to supply medical personnel for every branch of preparedness at home as well as in the field. It is the individual responsibility of each physician to supply information needed for those lists.

Additional copies of the questionnaire are available for those who may have mislaid them from the State Office at 493 Lowry Medical Arts

Building, Saint Paul, or from Chairman F. L. Smith at Rochester.

INOOPORTUNE

The American Medical Association goes on trial on the charge of violating the Sherman anti-trust law on October 21 in Washington, D. C.

At the same moment, the government which, through one arm has brought a criminal indictment against the officers and two component units of the association, will through another arm be asking and receiving essential aid to the defense of the United States.

The organization and discipline which is regarded as criminal by the justice department will be thankfully and eagerly put to use by the War Department in the selection of the men who will serve in the defense forces, in medical care for armed forces and in maintaining services for the civilian population.

If the usual procedure is followed, officers of the American Medical Association will be required to remain in Washington for the duration of the trial, a period that may run into weeks and months. At the same time, they will be forced to exert every effort at long range, to assemble and tabulate the enormous amount of information about the medical men of the country that was asked of them by the Surgeon General of the Army at the New York meeting.

The burden placed upon them at this critical time will seem the more indefensible to casual observers in view of the fantastic nature of the charges against which they are now called upon to defend themselves.

SICKNESS INSURANCE IN WISCONSIN

Experiments in sickness insurance in Wisconsin are now approaching a point where valid estimates can be made on their comparative popularity and soundness.

Several other states are also engaged in medically sponsored experimentation in this type of insurance but in no other state have three different plans been set up on a definitely experimental basis. Wisconsin's experience as set forth in extensive reports prepared for the September meeting of the House of Delegates of the Wisconsin State Medical Society therefore provides by far the most interesting information yet made available to students of new forms of payment for medical services.

Douglas County Coöperative

The first of these experiments was placed in actual service operation in Douglas County on July, 1939. It was a plan for prepaid medical care as conceived, organized and managed by a coöperative lay group. Contract provisions, premiums, benefits and similar items were accepted by the medical profession "without expression of judgment." Membership was open to any resident of Douglas county. Premiums as established by the lay group were \$2.90 per month per family; \$2.25 per month for man and wife and \$1.50 per month per single person. Each person applying was required to give a medical history in writing and to submit to and pay for a special physical examination. The subscriber was then eligible to complete physician's care without limitation as to extent or quantity.

Demand Limited

Committee comments in brief on a year's experience are as follows:

1. There is a very limited demand for medical care on a prepayment basis. After intensive and continuous membership drives, there were only 235 members at the end of June, 1940, a gain of only 97 over the subscribers in August, 1939. Most of them, furthermore, were in the income group above \$1,200 and all were of the "prompt pay class."

2. Physicians were paid an average of 71 per cent of normal charges in private practice; but the average would have been 55½ per cent if the plan had not received administrative contributions from the State Society. Contrary to predictions by coöperative association leaders, receipts were below what the same physicians would have received from the same patients in private practice.

3. Widespread duplication of the Douglas county plan would be feasible only if there were

large reserves of cash to draw upon or if a \$15 initiation fee were to be charged for each subscriber unit.

4. There was no evidence to indicate that there was a larger use of preventive measures by subscribers to the prepaid service than by others or by the same patients previous to entry into the plan. At the same time there was no marked nuisance demand for physician's care in this group which, in any case, could be placed definitely in the category of substantial, honest and reliable people.

Milwaukee Plan

The second experiment was placed in operation in Milwaukee on November 1, 1939. This plan was under direct sponsorship of the Milwaukee County Medical Society and its distinguishing feature was that each subscriber unit was obliged to pay the first \$24 worth of service from a physician member of the panel before he became eligible for services under the plan. After the initial payment, subscribers were entitled to unlimited care throughout the year so long as premiums were paid. Subscribers are selected on a group basis. Premiums are \$1.00 per family, 75 cents per month for man and wife, and 50 cents per month for a single person.

After an exhaustive campaign for subscribers, the required minimum of 200 was secured at Greendale, a Federal Government Housing project near Milwaukee, but further solicitation of other groups and of a large number of Milwaukee industries failed to secure a sufficient number of subscribers to warrant extending the plan to them.

During the first three months only one statement of \$57 of which \$24 was paid by the patient, met the qualifications. During the second quarter seven became eligible and at the beginning of the third quarter, 21, or 10 per cent, had met all the demands. On July 1, 36, or 21 per cent, had met the demands. By the end of the second quarter an estimated \$1,500 worth of service had been rendered to 21 subscriber families eligible for service under the plan. Of this amount a net of \$1,200 was paid to participating physicians.

Interest Slight

Comments by the committee follow:

1. Limited experience with this plan indicates that the deductible feature is basically sound and

should be included in some manner in future experimentation by the society.

2. The fact that there is very little uncultivated demand was shown in Milwaukee county as in Douglas county. The same lack of interest was noticed in the industrial groups solicited as at Parklawn where the requisite 200 subscribers were finally secured out of 600 families.

3. In this instance there was a notable lack of interest and coöperation among some of the physicians, also, particularly, those associated with industrial plants.

No Sale in Rock County

The third experiment initiated in Rock county by the physicians was never placed in actual operation because of lack of subscribers, but was offered for sale August 16, 1939. The plan was designed by the local medical profession, 75 per cent of whom participated. The premiums were set at \$3 per month per family, \$2 for man and wife, and \$1.50 for single persons. Selection of subscribers was based upon the group theory. Any group organized on other than a health basis was eligible if 50 per cent of the group participated. The medical service committee of the medical society directed solicitation. They were assisted by the assistant secretary of the State Medical Society of Wisconsin and an energetic campaign of personal solicitation and letters was carried on. Meetings were organized to explain the plan to industrial groups, pamphlets were distributed in pay envelopes and in doctors waiting rooms.

Chief Reaction Indifference

The committee said:

1. Virtually the only interest shown in the plan came from those with incomes above the limits set by the physicians. The reaction of others was chiefly one of indifference.

2. Several employers declared they would prefer to purchase insurance from a company with an established financial reserve in spite of the fact that the physicians themselves represent the actual and definite reserves of the plan proposed.

In no case were 50 per cent of the members of any group willing to join in the plan.

Reason Why

Just what the delegates to the House of Delegates of the Wisconsin Society will do with this

report is uncertain. They may or may not discontinue the experiments in September.

It is clear, however, that the popular demand for sickness insurance which the enthusiasts have always cited does not exist in three typical sections of Wisconsin. The probability is that it does not exist in Minnesota, either, nor anywhere else in the United States.

Reasons given by individuals who rejected the invitation to participate in these three plans were essentially economic in nature. They are summarized by the committee this way—

1. Lack of proper appreciation or evaluation of the comparative values of budgeting for medical care and of budgeting for such obligations as radio, appliances and automobiles.

2. Physicians' services during the past several years have not averaged the annual premium costs of \$36 a year.

3. Lack of funds on the part of some prospective subscribers.

4. Premiums are too high in the opinion of others.

IS IT CRIMINAL TO SAVE?

[Monthly Editorial Prepared by the Medical Advisory Committee]

Vital statistics show that a remarkable change in death rate in most diseases is taking place in this country and that consequently the span of life is increasing. Certainly this can be credited in great part to the type of medicine that is being practiced by our profession in the United States.

From hospital statistics, no less noticeable is the fact that fewer and fewer amputations are being performed in the cases of badly injured extremities. To those men who have practiced for a quarter of a century or more, the picture of the amputating knife is a familiar one; the painful stump, a "bug bear" and the artificial leg or arm, a commonplace.

Today, owing to the knowledge of asepsis, debridement, extension and the newer drugs employed, the mangled, torn, compound comminuted fracture is brought into alignment and a fairly serviceable extremity is the result. It is an acknowledged fact that a live leg or arm which has 75 per cent of its former efficiency is much better than the best that the most pro-

ficient artificial limb-maker with his mechanical skill can produce.

Yet, the medical man who not only saves the life of the patient but also gives him a good leg to use may be subjected to a malpractice suit because he could not again reproduce *in toto* the fine anatomic relations which prevailed before the accident. Why men who do remarkable restorations in these cases should be exposed, as any criminal might, to court ridicule is beyond the comprehension of your Medical Advisory Committee.

—B. J. B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS Saint Paul, Minnesota

Julian F. DuBois, M.D., Secretary

Scott County Drug Addict Committed to Willmar State Hospital

Re. State of Minnesota vs. Merten J. Stratton.
On August 7, 1940, Judge F. J. Connolly of the Probate Court of Scott County, made an order committing the above defendant, who is 45 years of age, to the State Hospital at Willmar, Minnesota, for treatment of drug addiction. Stratton, who resided at Belle Plaine, Minnesota, pleaded guilty on April 2, 1940, in the District Court of Scott County, to an information charging him with the crime of obtaining narcotic drugs by fraud and deceit. Judge Joseph J. Moriarty of the District Court, sentenced Stratton to a term of not to exceed 5 years at the State Prison at Stillwater, and suspended the sentence upon the condition that Stratton, who has used narcotics over a period of the past 20 years, be admitted to the Federal Hospital for Narcotics at Lexington, Kentucky, for treatment. Stratton made application to that hospital and was admitted on May 8, 1940.

Notwithstanding the fact that Judge Moriarty had provided in his order that Stratton was to remain at the Federal Hospital until he was certified by the proper authorities of that Hospital as cured, Stratton left against medical advice on July 31, 1940. He returned to Belle Plaine where he was found asleep in the reception room of a physician's office on August 4, 1940. The Minnesota State Board of Medical Examiners was notified and following a conference between Harry A. Irwin, County Attorney of Scott County, Judge Moriarty, and Mr. Brist representing the Medical Board, Judge Moriarty made an order revoking Stratton's suspended sentence, and providing that he be taken to the State Prison at Stillwater, Minnesota, unless, within 10 days, Stratton had been committed by the Probate Court of that County to the State Hospital at Willmar, for treatment of his drug addiction. On August 7, 1940, Judge F. J. Connolly of the Probate Court of Scott County, made an order committing Stratton to the State Hospital. Judge Moriarty's order also provides that unless Stratton remains at that Hospital for not less than one year, he must serve his sentence at the State Prison.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON JULY 12, 1940

June Examination

Alway, Robert Hamilton—U. of Minn., M.B. 1930; M.D. 1940, Saint Paul.
Ankner, Frank Joseph—Rush Med. Col., M.D. 1938, Thief River Falls.
Barnes, Russell George, Jr.—U. of Minn., M.B. 1938; M.D. 1939, Hastings.
Beck, Charles Joel—U. of Minn., M.B. 1940, Butte, Mont.
Beck, Norman Russell—U. of Pa., M.D. 1937, Rochester.
Bowers, Robert Newcomb—U. of Minn., M.B. 1939; M.D. 1940, Mazeppa.
Bratrud, Theodor Edward—Marquette U., M.D. 1940, Minneapolis.
Butter, John Robinson—U. of Minn., M.B. 1940, Eloise, Mich.
Decker, Charles Henry—U. of Minn., M.B. 1940, Eloise, Mich.
Domeier, Luverne Henry—Loyola, M.D., 1940, Sleepy Eye.
Drapiewski, John Frank—Harvard U., M.D. 1937, Rochester.
Drexler, George Warren—U. of Minn., M.B. 1939, Minneapolis.
Dupont, Joseph Arthur—Loyola, M.D. 1940, Excelsior.
Eckdale, John Edward—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.
Erickson, Eldon Wesley—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.
Estrem, Robert Daniel—U. of Minn., M.B. 1940, Fergus Falls.
Ferguson, William James, Jr.—Rush Med. Col., M.D. 1938, Chicago, Ill.
Francis, Gilbert Smuin—Northwestern U., M.B. 1939; M.D. 1940, Morgan, Utah.
Friberg, Joseph Bertil—U. of Minn., M.B. 1940, Saint Paul.
Friedman, Harry Samuel—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.
Gouze, Frank John—U. of Minn., M.B. 1940, Duluth.
Harper, Harry Penn—U. of Minn., M.B. 1936; M.D. 1937, Rochester.
Harri, Edward John—U. of Minn., M.B. 1940, Duluth.
Ives, Howard Rollin, Jr.—Yale U., M.D. 1937, Rochester.
James, Ellcry Meredith—Marquette U., M.D. 1940, Mankato.
Joffe, Harold Herman—U. of Ill., M.B. 1940, Duluth.
Joss, Charles Stevens—Northwestern U., M.B. 1939; M.D. 1940, Rochester.
Jurdy, Mitchell Joseph—U. of Minn., M.B. 1940, Minneapolis.
Kelly, Albert Charles—Marquette U., M.D. 1940, Coleraine.
Leeman, Judson Sheppard—U. of Minn., M.B. 1940, Newark, N.J.
Lehman, William Louis—U. of Minn., M.B. 1937; M.D. 1938, Minneapolis.
Lindahl, Wallace William—Northwestern U., M.B. 1938; M.D. 1939, Rochester.
Melancon, Joseph Francis—Marquette U., M.D. 1940, Saint Paul.
Nachtigal, Irving M.—U. of Minn., M.B. 1940, Eveleth.
Newell, Frank William—Loyola U., M.D. 1940, Saint Paul.
Papermaster, Ralph—U. of Minn., M.B. 1940, Minneapolis.
Patterson, Hugh Donald—U. of Minn., M.B. 1940, New Orleans, La.

In Memoriam

William A. Beach

Dr. William A. Beach, Mankato, died following a stroke June 12, 1940, at the age of seventy-one.

Dr. Beach was born at Ionia, Michigan, in 1868 and came to Minneapolis with his parents at the age of eleven. He graduated from the homeopathic department of the University of Minnesota medical school in 1893 and practiced for a short time at Windom and Saint Paul before locating in Mankato more than fifty years ago.

Dr. Beach was mayor of Mankato in 1921 and again in 1925 and served as city health officer from 1933 to 1935. He was also a member of the Mankato board of education over a long period of years. His extensive career as a public official was marked by the ardor with which he supported his convictions. For years he campaigned for regulation of the city's milk supply, urging city inspection of dairy herds and compulsory pasteurization of the milk supply of the city.

Dr. Beach is survived by his widow and two children, William E. Beach, Mankato and Mrs. William Lloyd, Albert Lea, and two step-daughters, Mrs. J. S. Graham, Minneapolis and Mrs. Theodore Wells, Grand Forks, North Dakota.

Frank W. Brey

Dr. Frank W. Brey of Wabasso died June 8, 1940, after suffering from a brain tumor for some nine months.

Dr. Brey was born in Lafayette township on March 22, 1886. He graduated from high school in New Ulm in 1904. He graduated from the medical school of the University of Minnesota in 1910, and began practice at Wabasso.

On November 21, 1921, Dr. Brey married Elizabeth K. Daub. His widow and six children, Anna Catherine, Theresa E., Alois, Virginia, Paul and Justine survive him.

Dr. Brey was a member of the Redwood-Brown County Medical Society, the Minnesota State and American Medical Associations. He was an upright citizen, at all times displaying a keen interest in community affairs. During his career he served on the school board, was village health officer and Redwood County coroner, besides being a member of various clubs and societies.

George A. Holdridge

Dr. George A. Holdridge, for nearly forty years leading physician, beloved country doctor of Benton County, was killed in an automobile accident July 3, 1940, as he was returning from a professional call.

Dr. Holdridge was born in Newark Valley, New York, March 31, 1879. He was graduated from Belle-

Pearson, Lawrence Orville Hicks—U. of Minn., M.B. 1940, Saint Paul.

Rosendahl, Frederick Glasoe—U. of Minn., M.B. 1939; M.D. 1940, Saint Paul.

Schmitz, Everett Joseph—U. of Minn., M.B. 1940, Minneapolis.

Shaw, Howard Arthur—U. of Minn., M.B. 1940, Minot, No. Dakota.

Shea, Andrew Whitman—U. of Minn., M.B. 1940, Minneapolis.

Smedal, Harald Aasvald—Harvard U., M.D. 1936, Rochester.

Soucheray, Philip Henry—U. of Minn., M.B. 1940, Jersey City, N. J.

Stark, Frederick Mosier—U. of Minn., M.B. 1940, Saint Paul.

Sutch, Gabriel Charles—U. of Minn., M.B. 1940, Saint Paul.

Tornberg, Gordon Carl—U. of Minn., M.B. 1939; M.D. 1940, Ely.

Williams, Ray David—Washington U., M.D. 1937, Rochester.

Wood, Clyde Othur—U. of So. Calif., M.D. 1937, Rochester.

By Reciprocity

Clauson, Carl Theron—U. of Wis., M.D. 1928, Bloomer, Wis.

Ittner, George Wash., Jr.—Washington U., M.D. 1937, Saint Paul.

Kucera, Lad John—Creighton U., M.D. 1939, Omaha, Neb.

Pierson, Roy Fredolph—U. of Neb., M.D. 1938, Slayton.

National Board Credentials

Duffalo, John August, Jr.—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.

Wood, William Walter, Jr.—U. of Minn., M.B. 1937; M.D. 1938, Rochester.

TREATMENT OF HABITUAL ABORTION WITH VITAMIN E

The Council on Pharmacy and Chemistry authorized publication of a report, prepared for it by one of its referees, on the value of vitamin E in the treatment of various disorders, particularly with reference to its alleged usefulness in habitual abortions. A critical examination of the evidence presented during the last eight years led to the following conclusions:

Claims that vitamin E (wheat germ oil) is of value in the treatment of menstrual disorders, failure of lactation and the vaginal pruitus after the menopause cannot be accepted because of lack of sufficient clinical evidence.

The claim that vitamin E is of value in the prevention of habitual abortion cannot be accepted because of the lack of convincing clinical evidence. The diagnosis of habitual abortion in many of the published reports is open to question; the great variation in dosage of vitamin E and the lack of evidence that the preparations used were active make it difficult to attribute any effects claimed for it to the vitamin. Moreover, the expectancy of spontaneous cure in cases of so-called habitual abortion has not been accurately established.

Although the administration of wheat germ oil probably does not cause the development of neoplasms, unfavorable effects may follow its use in certain cases. These effects are usually not serious.

The published results of the treatment of habitual abortion with vitamin E are sufficiently encouraging to justify further clinical experiment. Such experiments are justified only if preparations of vitamin E of known activity are used and if adequate diagnosis and clinical control can be established. (J.A.M.A., June 1, 1940, p. 2214.)

vue Hospital Medical College in 1900 at the age of twenty-one, the youngest member of his class. Shortly after graduating he came to Foley, Minnesota, where he established a successful practice. In 1907, he moved to Holdingford, Minnesota, where he practiced for two years, returning to Foley in 1909 in response to popular demand.

Dr. Holdridge was a man of sterling character and sound judgment. He took active part in community affairs and quickly became not only physician to every family in the county but trusted friend and wise counselor as well. He will long be remembered as a kind, generous neighbor, never too weary to lend a hand to every worthy cause, never too busy to pause for a cordial word or a cheery greeting as he went about his work. To say that he will be greatly missed in his community conveys but a fraction of the deep sense of loss his friends and co-workers feel at his tragic passing.

Dr. Holdridge served as chairman of the Benton County Health Association for thirty years; he acted as County Coroner for several years. He was a member of the Stearns-Benton County Medical Society, the Minnesota State Medical Association and the American Medical Association. Besides his medical work he served as County Commissioner for eight years, acting as chairman of the Board from 1933 to 1939.

In 1902 Dr. Holdridge married Fannie E. Osborne who, with a son, William, and three daughters, Ida, Katherine, and Helen, survive him. Two sisters and one brother also survive.

Herbert W. Jones

Dr. Herbert W. Jones who had practiced medicine in Minneapolis for thirty-five years, died suddenly while returning from Cottage Grove, Minnesota, on July 9, 1940.

Dr. Jones was born in Berlin, Wisconsin, on October 13, 1873. He was the son of Griffith Franklin Jones of Berlin, a merchant. His grandparents were pioneers in that section of Wisconsin. He obtained his preliminary education in Berlin and later took his medical course at the University of Minnesota. He was captain of the University track team in 1900. He graduated in 1902 and then took a year's internship at St. Luke's Hospital, Saint Paul. After finishing his internship he went to Faulkton, South Dakota, to take over the practice of Dr. Edgerton for a short time. In 1905 he returned to Minneapolis and became associated with the late Dr. W. A. Jones, with whom he practiced for about ten years. In 1906 he went to Vienna where he took a course in neurological and general surgery for a year and then returned to Minneapolis associating himself with Dr. W. A. Jones and Dr. A. S. Hamilton.

In June, 1909, Dr. Jones married Margaret Daniels of Minneapolis.

Dr. Jones was very much interested in the Medical Alumni of the University of Minnesota. He was secretary of the organization for a number of years and at one time its president. It was his desire that the

alumni body should act in an advisory capacity to the teaching faculty and Regents of the University, and he spent much time on committees working to help in the development of the medical department. Much of the success of the medical alumni was due to the indefatigable efforts of Dr. Jones in its incipient stage.

Dr. Jones was a member of the Asbury and Northwestern Hospital staffs, and was president of the Northwestern Hospital staff in 1936 and 1937. He was also an honorary member of the American Neurological Association, a member of the Minnesota Academy of Medicine, American Medical Association, Hennepin County Medical Society and other state and county associations. He was a member of the Nu Sig Nu Fraternity and the M Club at the University of Minnesota. He associated himself with the Westminster Church.

Dr. Jones was held in high esteem by all of his colleagues. He had good judgment which was appreciated by the medical profession. Many of the early operations in neurological surgery in Minneapolis were performed by him.

Dr. Jones, who lived at 2418 W. 22nd Street, is survived by his wife, three sons, Dr. H. W. Jones, Jr., who has occupied offices with his father since his graduation in medicine; Roderick Daniel, and David Griffith, and two sisters, Mrs. R. E. Daniel of Minneapolis and Minnie W. Jones of DeKalb, Illinois.

A. E. BENJAMIN, M.D.

Earl H. Marcum

Dr. Earl H. Marcum, Bemidji, died August 5, 1940, following injuries sustained in an automobile accident three days previous.

Dr. Marcum was born August 14, 1878, in southeastern Iowa, but moved to Crookston, Minnesota, with his parents in 1880. After attending high school in Crookston he attended Hahneman Medical College in Chicago, graduating in 1903. He began practice the same year in Bemidji.

In August, 1917, Dr. Marcum entered the service and was stationed at Fort Riley, Chicago University and Rush Medical College. He later went to France with the Twentieth Evacuation Hospital and had much surgical experience there.

In 1925 Dr. Marcum visited England, Ireland, France and Belgium as a member of the party of 850 in the Inter-State Postgraduate group.

Dr. Marcum was married in 1902 at Crookston to Elizabeth Davies. He is survived by his widow and his brother, Walter F. Marcum, of Bemidji.

Dr. Marcum was a member of the Upper Mississippi Medical Society, the Minnesota State and American Medical Associations. He was active in the civic and fraternal life of Bemidji, being identified with various movements for the betterment of the city. Serving as captain in the medical corps of the army during the World War he was later promoted to major and still later lieutenant colonel in the Medical Corps Reserve. He had passed the examinations for a full colonelcy and had expected to receive that commission shortly.

OF GENERAL INTEREST

Dr. and Mrs. O. J. Campbell of Minneapolis announce the birth of a daughter, August 5.

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Dr. and Mrs. E. V. Strand and children of Bayport recently spent a week motoring on the North Shore.

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A daughter was born July 31 to Dr. and Mrs. Harvey J. Brekke of Minneapolis.

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A son was born to Dr. and Mrs. Philip A. Anderson of Minneapolis, July 23.

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Dr. C. H. Sherman of Bayport has moved his office to Stillwater.

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Dr. C. F. Dixon of Rochester addressed a meeting of the Wyoming State Medical Society in Sheridan last month.

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Dr. Roscoe C. Webb of Minneapolis has been elected secretary-treasurer of the Great Northern Railway Surgeons' Association.

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Dr. and Mrs. D. Kalinoff and Miss Helen Kalinoff returned to Stillwater about the first of June after an extended visit in the South.

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Dr. Siegfried C. G. Oeljen of Waseca has moved into his newly completed office building north of the courthouse. The building, which houses only his offices, is of brick and is 22 x 47 feet.

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Dr. John R. Meade of Saint Paul announces the limitation of his practice to Internal Medicine, and also removal of his offices to 836 Lowry Medical Arts Building, Saint Paul.

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Dr. Hugh W. Hawn has finished a fellowship in ophthalmology in the Mayo Foundation in Rochester and is now a member of the staff of the Fargo Clinic, Fargo, North Dakota.

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Dr. P. E. Kierland of Alexandria made newspaper headlines recently when he rescued two fishermen whose boat upset on Lake Mina. A third man in the boat died of a heart attack.

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Dr. Charles H. Mead of Duluth recently passed the National Board examinations in surgery. It is believed he has the distinction of being the first Duluth surgeon to have passed the examination.

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Dr. William C. Bernstein, who has been practicing in New Richland, has entered the University of Minnesota graduate school to do work in proctology for two years.

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Dr. M. O. Henry addressed the Pierce-St. Croix Counties Medical Society on "Treatment of Fractures of the Upper Extremities" Thursday, August 15, at Baldwin, Wisconsin.

Dr. William M. Moir, Jr., of Minneapolis, who has been a resident physician in internal medicine at the University of Minnesota Hospitals, became associated with Dr. W. R. Humphrey of Stillwater, July 1.

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Dr. Frank F. Wildebush of Minneapolis, Lieutenant Commander, Medical Corps, U. S. Naval Reserve, is taking special work in head and neck surgery at the Naval Medical Center in Washington, D. C.

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Miss Margaret G. Arnstein has resigned as director of public health nursing at the University of Minnesota to rejoin the staff of the New York State Health department. Miss Mellie F. Palmer has been named acting director.

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Dr. George B. Logan, who has been associated with the Department of Pediatrics at the University of Minnesota Medical School since January 1, 1940, has returned to the Mayo Clinic as a first assistant in the Section on Pediatrics.

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The marriage of Dr. William H. Hollinshead, Jr., and Miss Mary Waddell of Saint Paul took place July 16. Dr. James B. Avey of Excelsior was best man. Among the ushers were Dr. Robert Alway and Dr. Charles Naumann McCloud, Jr.

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Dr. Robert Gray, a graduate of Northwestern University Medical School, has located in Marshall and is associated with his father, Dr. F. D. Gray, and Dr. B. C. Ford in the Marshall Hospital and Clinic. He interned in the Swedish Covenant Hospital in Chicago.

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Dr. Marvin J. Stewart has located at Marietta, opening offices there late in July. A graduate of the University of Minnesota Medical School, Dr. Stewart for the past year has been resident physician and surgeon at the Miller Hospital in Minneapolis.

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Dr. R. G. Barnes, Jr., of Duluth is now associated with Dr. R. C. Radabaugh in Hastings. Dr. Barnes, who was graduated from the University of Minnesota Medical School, has been located at Hackensack, New Jersey.

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Dr. Marcus H. Flinter, head of the Cass Lake Indian Hospital at Cass Lake, has been transferred to Arizona where he will be in charge of an Indian tuberculosis sanitarium at Phoenix. His successor in Cass Lake has not yet been named.

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Dr. Richard B. Girvin has been appointed Minneapolis medical examiner for the Civil Aeronautics Authority. This post was formerly held by Dr. Albert J. Herbolshemer who is now in Washington, D. C., with the CAA.

OF GENERAL INTEREST

Dr. C. H. Sherman has located in Stillwater, opening offices at 228 East Chestnut street. For the past year, Dr. Sherman has been associated in practice with Dr. E. V. Strand of Bayport. He previously practiced in Oakes, North Dakota.

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Dr. James A. Johnson of Minneapolis does not shirk his responsibilities as a member of medical associations. He is serving as president of three different groups—the Minneapolis Surgical Society, the Minnesota Academy of Medicine, and the Hennepin County Medical Society.

* * *

Dr. Miland E. Knapp of Minneapolis, third vice president of the American Congress of Physical Therapy, will present a paper at the nineteenth annual meeting of the Congress in Cleveland, September 2-6. His paper will be on the rôle of physical therapy in the treatment of fractures about the elbow joint.

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Construction of a nurses' dormitory and Mother House at the Lutheran Deaconess Home and Hospital in Minneapolis is expected to get under way soon. The new structure, whose cost is estimated at \$75,000, will be ready for occupancy shortly after the first of the year.

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Dr. Robert H. LaBree, a member of the Rood Hospital staff in Chisholm, and Miss Bernardine Brown were married July 20 in Hibbing. Dr. John W. LaBree was his brother's best man. Included among the ushers were Dr. Carlyle Tingdale and Dr. Theodore Schweiger.

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Dr. Charles K. Petter, who was formerly associated with Glen Lake Sanatorium, is medical director and superintendent of the Lake County Tuberculosis Sanatorium in Waukegan, Illinois, which recently completed construction of a new modern building. Dedication exercises were conducted August 18.

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Dr. G. J. Shima of Montgomery opened offices in Sleepy Eye in August. Dr. Shima, who received his B.A. degree from the University of Minnesota, took his medical work at Creighton University in Omaha, receiving his M.D. degree in 1939. He recently completed a year's internship at St. Joseph's Hospital in St. Paul.

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Dr. Milton LeVine, who received his Ph.D. degree in bacteriology from the University of Minnesota in June, 1939, has been appointed instructor in bacteriology, succeeding Dr. M. V. Novak who resigned last spring to take a post as assistant professor at the University of Illinois College of Medicine.

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Dr. Elmer C. Paulson, son of Dr. and Mrs. T. S. Paulson of Fergus Falls, married Miss Ethel Mobraaten of Virginia, August 3. After a wedding trip at Yellowstone Park and the Black Hills, Dr. and Mrs. Paulson are at home at Dalton. Dr. Paulson has been in general practice at Dalton for the past two years.

Dr. John W. Johnson, who has completed a residency at the General Hospital in Wyandotte, Michigan, has become associated in practice with his father, Dr. Hans Johnson at Kerkhoven, Minnesota. Dr. Johnson is a graduate of the University of Minnesota Medical School, '38. The building in which they have their offices has been remodeled, and an addition constructed.

* * *

Dr. Robert D. Evans of Minneapolis, accompanied by his daughter, Betty Jo, and his son, Robert, Jr., motored to California in June. They visited the Bryce and Zion Canyons in Utah enroute and had an interesting experience taking colored movies and Kodachrome "stills." Both of these national parks are a paradise for the amateur color photographer, they report.

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Dr. George T. LeClercq, a graduate of the University of Minnesota Medical School, became affiliated in July with the Massachusetts General Hospital in Boston where he is doing special work in radiology. For six months prior to becoming associated with Massachusetts General Hospital, Dr. LeClercq was a graduate student at Peter Bent Brigham hospital.

* * *

Dr. R. Wynn Kearney has opened offices for the general practice of medicine and surgery in Mankato. Dr. Kearney is a graduate of the Mankato high school and of the Northwestern University Medical School. After receiving his medical degree from Northwestern in 1935, he interned at Ancker Hospital in Saint Paul. Since 1936, he has been a fellow in the Mayo Foundation in Rochester.

* * *

Organization of the Long Prairie Clinic and Hospital at Long Prairie by Drs. M. G. Ericsson, B. L. Gifford and M. E. Mosby is announced. The new arrangement gives Long Prairie one hospital instead of two. The hospital facilities will be available to doctors in the area.

Construction of an addition to the present Long Prairie hospital, which will also be completely remodeled, is now under way.

* * *

For the first time, internes taking duty in Minneapolis hospitals in July automatically become Junior Members of the Hennepin County Medical Society. Their membership continues as long as their status as internes continues. This new membership ruling was voted by the Society last November, and became effective with the new July group of internes. Fellows and Residents make individual application for Junior Membership as previously.

* * *

Among new Diplomates of National Boards through examination are Drs. Abe Bert Baker and Nathaniel Joseph Berkwitz of Minneapolis who have been certified by the American Board of Psychiatry and Neurology; Dr. Reuben Berman of Minneapolis, by the American Board of Internal Medicine; Dr. Lawrence Myrlyn Larson, by the American Board of Surgery, and Dr. Robert Russell Tracht, by the American Board of Ophthalmology.

OF GENERAL INTEREST

Among Minneapolis physicians who have been soldiers and sailors this summer are: Drs. Abe B. Baker, Philip Hallock and Theodore H. Sweetser who gave ear to bugle calls at Fort Snelling; Dr. John A. C. Leland, Jr., who has been at San Diego Naval Base; Drs. Einer C. Andreassen, Harry F. Bayard, Ralph H. Creighton, George F. Schmidt and Frederic F. Wiperman, Camp Ripley; Dr. Donald McCarthy who cruised the Great Lakes aboard the "Paducah."

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Speakers at the summer meeting of the Upper Mississippi Valley Medical Society at Cass Lake, August 9-10, included besides Dr. Michelson, Dr. C. A. Stewart of Minneapolis who spoke on "Infant Feeding"; Dr. F. L. Smith of Rochester whose paper was entitled, "Diagnosis and Treatment of Conditions Associated with Varicose Veins"; and Dr. Macnider Wetherby of Minneapolis who discussed "Rheumatic Conditions."

* * *

Returning to Minneapolis August 11 after speaking before a meeting of the Upper Mississippi Valley Medical Society at Cass Lake, Dr. Henry E. Michelson of Minneapolis was injured when his automobile was struck by another machine being pursued by Brainerd police. Dr. Michelson, who received a fractured patella, several fractured ribs and minor head injuries, has been confined to Northwestern Hospital in Minneapolis since.

* * *

The wife and children of a former fellow in the Mayo Foundation have arrived in Rochester from England to be guests of Dr. and Mrs. V. S. Counsellor for the duration of the war. They are Mrs. A. H. McIndoe and her children, Vanora and Adonia. Dr. McIndoe is chief plastic surgeon to the Royal Air Force.

Also from England have come Mrs. C. Nauton Morgan and her children, Sally and Michael, to be guests of Dr. and Mrs. C. W. Mayo at Rochester during the war.

* * *

The George B. Wright Memorial Hospital of Ferguson Falls dedicated on July 25 a beautiful new community room, furnished by patrons of the hospital. The room is to be used for meetings of the staff and auxiliary, and for health instruction for hospital patients and people of the community.

Speaker at the dedicatory exercises was Dr. W. A. O'Brien of Minneapolis who spoke on "The Place of the Community Hospital and The Care of the Sick." Gabriel A. Skomars is hospital administrator.

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Two Minnesota physicians are scheduled to participate in the Jackson County Health Forum in Kansas City, Missouri, during the 1940-41 season. The forum of lectures given on the third Wednesday of each month is sponsored by auxiliaries of all the accredited hospitals in Jackson County. Dr. Walter C. Alvarez of Rochester is scheduled to give the November 20 lecture. His subject will be "What's the Matter with the Patient Who Is Tired All the Time?" Dr. William A. O'Brien of Minneapolis will give the final lecture, May 21, his topic being "Medicine Meets Middle Age Needs."

Among those who began fellowships in the Mayo Foundation, July 1, are Dr. Eldon W. Erickson of Minneapolis and Dr. Charles W. Fogarty of St. Paul, graduates of the University of Minnesota Medical School; Dr. Charles F. Stroebel of Northfield; Dr. David B. Judd of Rochester, son of the late Dr. E. Starr Judd; Dr. Frank S. Ashburn who was a fellow in medicine at the University of Minnesota on duty in Minneapolis General Hospital from 1939-40; Dr. George A. Hallenbeck of Rochester, son of Dr. D. F. Hallenbeck; Dr. Richardson W. Lyman who interned at the University Hospitals in Minneapolis from July, 1939 to July, 1940; Dr. William J. Ferguson who was interne at Minneapolis General Hospital from January, 1939, to July, 1940; and Dr. Richard E. Reiley who was interne at Fairview Hospital in Minneapolis 1938-39, and teaching fellow in orthopedic surgery at the University of Minnesota from July, 1939 to July, 1940.

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Dr. Orin P. Thorson of Northfield has disposed of his practice and is taking postgraduate work in Chicago and at the University of Minnesota before leaving October 1 to join the Benson Clinic in Bremerton, Washington. Dr. Thorson, a University of Minnesota graduate, has been in Northfield for twelve years. In his new location he will do diagnostic work and assist in surgery.

Dr. Robert F. Mears, recently of the General Hospital in Minneapolis, is taking over Dr. Thorson's practice. Dr. Mears is a graduate of the University of Minnesota Medical School.

* * *

Dr. O. J. Hagen of Moorhead has filed as a candidate for the Republican nomination for the United States Senate. Dr. Hagen is prominent in educational circles, as well as medical activities, having served six years as a member of the University of Minnesota board of regents and eight years on the State Teachers college board.

He was president of the Minnesota Public Health association in 1936; a member of the state board of health for some time; a councilor for Minnesota of the American College of Surgeons for five years; president of the Northern Minnesota Medical Association; and president of the Clay-Becker county sanatorium for seven years.

Another Minnesota physician who may enter the political race is Dr. J. Lawrence McLeod of Grand Rapids, whose friends are urging him to run as a Republican candidate for lieutenant governor.

* * *

When the continuation course in Clinical Allergy was held at the University of Minnesota Center for Continuation Study July 29-August 3, physicians from four states were in attendance.

The registration list follows: Drs. Percival H. Benning of St. Paul, Luther F. Davis of Wadena, J. W. Helland of Spring Grove, Samuel J. Hillis of Minneapolis, Fritz B. Schleinitz of Battle Lake and Thomas Myers of St. Paul; also Dr. Robert W. Currie of Billings, Montana, and Dr. Homer L. Hiles of Pittsburgh, Pennsylvania. From Wisconsin came Drs. Enoch

OF GENERAL INTEREST

B. Brick of Wausau, Harold L. Miller of Milwaukee, Margaret V. Pirsch of Kenosha and Raymond H. Smits of West Allis.

The faculty for the course was made up of: Drs. Walter C. Alvarez, Louis A. Brunsting and Charles K. Maytum of Rochester; Beecher B. Barnum and J. M. Nolte of Minneapolis; and Drs. Lawrence R. Boies, Ralph V. Ellis, Ralph W. Koucky, William A. O'Brien, Elmer M. Rusten, Wallace Sako, Albert V. Stoesser, Horatio B. Sweetser, Jr., and Asher A. White of Minneapolis.

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Medico-Military Inactive Status Training

The twelfth annual inactive status training course for Medical Department Reserve officers of the U. S. Army and Navy will be held at the Mayo Foundation, Rochester, Minnesota, October 6 to 20, 1940. As in former years, special work in clinics and hospitals will be offered during the morning hours for those asking special assignments. Presentations of selected subjects in military medicine are scheduled. There will be appropriate sections or special courses for officers of the Dental and Veterinary Corps. All Medical Department Reserve officers on the active list are eligible for enrollment. Approved applicants will be enrolled on the recommendation of the Surgeon of the Seventh Corps Area or the Surgeon of the Ninth Naval District. Applications should be made at an early date and should be forwarded through the respective Reserve headquarters of the officers concerned.

Physicians Wanted for CCC Duty

Physicians are needed for the medical service of the Civilian Conservation Corps. The initial salary is \$3,200 per annum. No quarters for families are provided, and the physicians are required to pay for their food at camps. Temporary quarters for physicians are provided at the camps for a nominal fee. Physicians selected for this service are required to pay their own travel expenses to the headquarters of the district in which they are to be employed, where they are put on temporary duty for instructional purposes before being sent to camps. Travel expenses incurred in the transfer of physicians from the district headquarters to camps or in transfer from one camp to another are paid by the Government. If the services rendered are satisfactory, the employment is more or less permanent.

The principal duties at camps consist of the medical care of the enrollees and the practice of preventive medicine. To be eligible for this service, the physician must be a citizen of the United States, a graduate of an accredited medical school authorized to confer the degree of doctor of medicine, licensed to practice medicine, and physically able to perform the duties involved. Physicians over sixty years of age are not ordinarily employed.

All physicians interested in this type of service are requested to submit their applications to the Office of

the Surgeon, Headquarters Seventh Corps Area, Federal Building, Omaha, Nebraska, giving date on which available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas, and Arkansas.

It is requested that young physicians not now listed in the American Medical Directory be informed of this service.

Physicians Needed for Army Service

The physician, like every other American, has become actively interested in our national security and stands ready to contribute his services as required for military preparedness.

The immediate problem in this connection is one that concerns the War Department, and primarily the young physician. The War Department must procure sufficient additional personnel from the medical profession to augment the medical services of the Regular Army as the various increases are made in the strength of the Regular Army, as authorized by Congress to meet the partial emergency. The young physician is especially concerned because it is usually advantageous, and is often more convenient for him to serve with the Army.

Present plans of the War Department are designed to make service attractive and instructive for the young physician. If the physician holds a Medical Corps Reserve commission he can be ordered to active duty if he so requests. If he does not hold a commission, but is under 35 years of age and is a comparatively recent graduate of an accredited school, he may secure an appointment in the Medical Corps Reserve for the purpose of obtaining extended active duty for a period of one year or longer. Duty is given at General Hospitals, Station Hospitals, and with Tactical Units, and embraces all fields of general and specialized medicine and surgery. Excellent postgraduate training is obtainable in connection with Aviation Medicine. After serving six months of active duty in the continental United States, a Reserve officer may request duty in Hawaii, Panama, or other United States territories and possessions. The initial period for duty is for one year and yearly extensions are obtainable thereafter until the international situation becomes more clarified and our domestic military program becomes stabilized.

Many young doctors who have served with the Army on extended active duty have taken the competitive examination for entrance into the Medical Corps of the Regular Army. Extended active duty affords an excellent opportunity for the physician to observe modern military medicine and the facilities that exist for a complete and comprehensive medical practice.

Pay is according to rank, and, including subsistence and quarters allowances for an officer with dependents, amounts to an annual sum of \$3,905 for a Captain and \$3,152 for a First Lieutenant; or, without dependents, to an annual sum of \$3,450 for a Captain and \$2,696 for a First Lieutenant. In addition, reimbursement is made for travel to duty station and return.

Further information may be obtained by writing to The Surgeon General, U. S. Army, Washington, D. C.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR SEPTEMBER

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis; Station WLB, University of Minnesota; and KDAL, Duluth.

Speaker, William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

September 7—Cause of Home Accidents

September 14—Prevention of Home Accidents

September 21—First Aid in the Home

September 28—Injury of the Teeth

AMERICAN PUBLIC HEALTH ASSOCIATION

The sixty-ninth annual meeting of the American Public Health Association will be held in Detroit, Michigan, October 8 to 11, inclusive, at the Book-Cadillac Hotel. Approximately 3,500 health officials are expected to attend. A number of allied associations will meet at the same time and place.

Dr. Reginald M. Atwater is executive secretary. He has offices at 50 West 50th Street in New York City.

INTERNATIONAL ASSEMBLY—INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

This year's assembly will be held in spite of foreign war and the political campaign at home, in the Public Auditorium, Cleveland, Ohio, October 14 to 18.

Members of the Ohio State Association and the Cuyahoga County Medical Society and of the Academy of Medicine of Cleveland are hosts to the Assembly and extend a cordial invitation to all members of the profession in good standing. Physicians are urged to bring their ladies, for whom entertainment is being arranged.

Morning, afternoon and evening sessions for five days will be filled by some eighty outstanding teachers from all over the country. The Saturdays preceding and following the Assembly will be devoted to clinics in the Cleveland hospitals. Excellent scientific and commercial exhibits will contribute an important part of the meeting.

This year, Dr. Chevalier Jackson, Philadelphia, is President; Dr. George W. Crile, Cleveland, Chairman of the Program Committee and Dr. William B. Peck, Freeport, Illinois, continues as Managing Director.

The annual dinner will be held October 16 with Dr. Chevalier Jackson as Master of Ceremonies. Addresses will be given by Dr. Ross T. McIntire, Surgeon-General, United States Navy, and Dr. Nathan B. Van Etten, President of the American Medical Association.

On page xxiii of the advertising section of this issue appears a list of clinicians who will take part in the scientific program, and further information regarding the meeting.

CLASSROOM RADIO HEALTH TALKS

A series of classroom radio health talks to be given by Dr. William A. O'Brien, professor of preventive medicine and public health at the University of Minnesota, is announced.

The talks, to be broadcast over the University station WLB, will be given each Wednesday from 11:05 to 11:20 a. m., beginning September 25 and continuing through January 15. Physicians are urged to call the attention of their school superintendents to these classroom broadcasts designed for pupils of grades six through nine. The program is endorsed by the Minnesota State Medical Association and the Minnesota Public Health Association.

The schedule for the lecture series, known as "Your Health and You," follows:

September 25—Health Ideas and Practices
October 2—Foods We Eat
October 9—Nutrition of Body
October 16—Weight and Health
October 23—Mind and Body
October 30—Rest and Sleep
November 6—Feet and Posture
November 13—Play, The Business of Childhood
November 20—Cleanliness and Godliness
November 27—Air and Sun
December 4—Eyes and Ears
December 11—Mouth, Gateway to Health
December 18—Fads and Fallacies
January 8—Prevention Versus Cure
January 15—Community Health

SCHOOL OF NURSING AT HAMLINE UNIVERSITY

Hamline University and Asbury Hospital of Minneapolis have announced the establishment of a School of Nursing offering a five-year curriculum leading to the degree of Bachelor of Science in Nursing. The first class will be admitted in September, 1940.

The combined resources of Hamline University and Asbury Hospital will be used to provide a course of training that will equip young women of superior qualifications to meet the professional needs of the community and to derive high personal satisfaction from their lives in general and their profession in particular. Preference will be given to those applicants who rank in the upper third of their high school graduating class and whose personality and character traits specially fit them for the field of nursing.

The first three semesters of the course will be taken on the campus of Hamline University. The next five semesters will be taken at Asbury Hospital and affiliated institutions. The last two semesters will be taken at Hamline University. Upon the satisfactory completion of the entire course, students will be awarded the degree of Bachelor of Science in Nursing.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER

The American Society for the Control of Cancer, 350 Madison Avenue, New York City, will furnish without charge copies of the following pamphlets upon request. While these pamphlets have in the past been sold and some appeared several years ago, they contain valuable information and are being given away for the good of the cause.

The pamphlets available are:

- No. 40.—*Cancer of the Breast*, by Arthur H. Estabrook, Ph.D.—an eight page reprint from the "Trained Nurse and Hospital Review," Jan., 1939, with photographs showing steps in the radical surgical operation for breast cancer.
- Re. 1.—*Biopsy in Mammary Cancer*, by James Ewing, M.D.—two page reprint from the *Bulletin of the American Society for the Control of Cancer*, Jan. 1933. A plea for proper methods of biopsy.
- Re. 4.—*The doctor's Practical Relation to the Cancer Problem*, by William Carpenter MacCarty, M.D.—a five page reprint from the *Bulletin of the American Society for the Control of Cancer*, May, 1933. Points on prognosis.
- Re. 6.—*The Responsibility of the Practitioner in Menopausal Bleeding*, by James E. King, M.D.—three page reprint from the *Bulletin of the A.S.C.C.*, July, 1932.
- Re. 7.—*Early Diagnosis of Carcinoma of the Cervix*, by Dr. Henry Schmitz—three page reprint from the *Bulletin of the A.S.C.C.*, June, 1933.
- Re. 8.—*The Family Physician's Place in the Control of Cancer of the Uterus*, by S. W. Cathcart, M.D.—three page reprint from the *Bulletin of the A.S.C.C.*, Nov., 1933.
- 2018.—*Transillumination of the Breast*, by Max Cutler, M.D.—16 page reprint, 1933. On the use of transillumination as a confirmatory aid in diagnosis.
- 2019.—*Cancer of the Breast*, by Grantley W. Taylor, M.D., F.A.C.S., reprinted from the *International Abstract of Surgery*, July, 1932. Prepared at the request of the Comm. on the Treatment of Malignant Diseases, Amer. Coll. of Surgeons. 24 pages. Review of methods of diagnosis, treatment and results. Bibliography.
- 2020.—*Collective Review of the Recent Literature on Malignant Tumors of the Uterus*, by George H. Gardner, M.D., F.A.C.S., and George C. Finola, M.D. Reprinted from *Surgery, Gynecology, and Obstetrics*, Jan., 1934. 24 pages. Review of Methods of Treatment and Results. Bibliography.
- 2021.—*Radiosensitivity of Tumors*, by Fred W. Stewart, M.D., reprinted with additions from the *Archives of Surgery*, Dec., 1933. 88 pages. A technical presentation of special interest to radiologists.
- 2024.—*Cancer of the Stomach*, by Howard K. Grey, M.D., and Donald C. Balfour, M.D., reprinted from the *American Journal of Cancer*, Oct., 1934. 28 pages. A technical presentation with bibliography.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The Southern Minnesota Medical Association will hold a one-day meeting in Red Wing, September 23. The day's program of talks will be climaxed with a banquet.

The complete program follows:

Morning Session—9:00 A.M.

- "The Use of Peridural Anesthesia for Office Procedure"—L. I. YOUNGER, M.D., Winona
- "Seminal Vesiculitis"—R. F. HEDIN, M.D., Red Wing
- "Recent Advances in Treatment of Common Skin Diseases"—L. A. BRUNSTING, M.D., Rochester
- "Incisional Hernia and Methods of Repair"—A. E. BENJAMIN, M.D., Minneapolis
- "Brucellosis"—I. FISHER, M.D., Ceylon
- "Diagnosis of Pancreatic Disease"—M. W. COMFORT, M.D., Rochester
- "The Effect of Digitalis on the Coronary Blood Flow"—R. V. SHERMAN, M.D., Red Wing
- "Pathology in the Bronchi and the Esophagus: A Clinical and Endoscopic Study of Recent Cases"—V. J. SCHWARTZ, M.D., Minneapolis

"Diagnosis and Surgical Treatment of Diaphragmatic Hernia" (Motion picture)—S. W. HARRINGTON, M.D., Rochester

Afternoon Session—2:00 P.M.

Case Reports

- "Carcinoma of the Stomach"—J. T. PRIESTLEY, M.D., Rochester
- "The Diagnosis and Treatment of Pneumonia by the General Practitioner in Rural Districts"—R. V. WILLIAMS, M.D., Rushford
- "Evaluation of Sulfathiazole in the Treatment of Human Disease"—WESLEY SPINK, M.D., Minneapolis
- "Practical Suggestions Regarding Use of Protamine Insulin"—E. H. RYNEARSON, M.D., Rochester
- "Fractures of the Tibia"—E. H. JUERS, M.D., Red Wing
- "Organization of the Draft Boards for National Emergency"—LT. COL. H. E. HULLSIEK, M.D., Saint Paul

Evening Session—6:30 P.M.

Banquet

- "Minnesota Medical Association: Its Activities and Aims"—B. S. ADAMS, M.D., Hibbing
- "State Board of Health Problems"—T. B. MAGATH, M.D., Rochester
- Presidential Address—JAMES MORROW, M.D., Austin

MISSISSIPPI VALLEY CONFERENCE ON TUBERCULOSIS and MISSISSIPPI VALLEY SANATORIUM ASSOCIATION

An invitation is extended to all physicians to attend the twenty-seventh annual meeting of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association, which will meet at the Lowry Hotel in Saint Paul, October 2, 3 and 4.

The Mississippi Valley Conference is composed of lay and medical members active in the anti-tuberculosis work of the local and state Christmas Seal organizations in Illinois, Indiana, Kansas, Michigan, Minnesota, Iowa, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin. Minnesota is represented on the Conference Council by the following physicians: Drs. Lewis S. Jordan, Granite Falls; Walter J. Marcle, Duluth; E. S. Mariette, Oak Terrace; E. A. Meyerding, Saint Paul; and J. A. Myers, Minneapolis.

Governor Harold E. Stassen will be the principal speaker at the dinner meeting on Thursday, October 3. His subject will be "Social and Economic Problems in the Decade Ahead." Dr. Everett K. Geer, first vice president of the Ramsey County Public Health Association, will give the address of welcome.

The annual meeting of the Minnesota Public Health Association, one of the affiliated organizations, will be held Thursday noon, October 3.

An interesting feature of the scientific exhibits will be the Leitz projector, which enlarges an x-ray film to full motion picture screen size. The projector is the only one of its kind in the United States. A special x-ray conference is scheduled for Friday night under the direction of Dr. John H. Skavlem of Cincinnati, Ohio.

Speakers at a College Hygiene luncheon scheduled for Friday noon will include the following physicians:

REPORTS AND ANNOUNCEMENTS

Dr. Ruth E. Boynton of Minneapolis, president of the American Student Health Association; Dr. J. A. Myers, Professor of Preventive Medicine at the University of Minnesota; Dr. Charles E. Lyght of Northfield, chairman of the Tuberculosis Committee, American Student Health Association.

Dr. Paul A. Teschner of Chicago, Assistant Director of the Bureau of Health Education of the American Medical Association, will preside at a panel Friday afternoon, October 4, on "Nursing Problems in a Sanatorium." Physicians taking part in the panel are: Dr. M. H. Draper, Secretary and Medical Director, Irene Byron Sanatorium, Fort Wayne, Indiana; Dr. J. Vincent Sherwood, Superintendent and Medical Director, South Dakota State Sanatorium, Sanator, South Dakota; and Dr. John W. Towey, Superintendent and Medical Director, Pinecrest Sanatorium, Powers, Michigan.

Joint meetings of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association are scheduled for Thursday, October 3. Separate meetings will be held Friday, October 4. The medical session program are as follows:

JOINT MEETING

Thursday, October 3, 1940

Morning Session

Presiding: THEODORE J. WERLE, Executive Secretary, Michigan Tuberculosis Association

1. "A nation-wide survey on food handlers and infections"
JOHN S. KRUGLICK, M.D., Assistant Medical Director, Tuberculosis Institute of Chicago and Cook County, Chicago, Illinois.
 2. "Silico-Tuberculosis in Missouri"
Under the co-authorship of WILLIAM M. KINNEY, M.D., and JESSE E. DOUGLAS, M.D., Superintendent, Jasper County Tuberculosis Hospital, Webb City, Missouri.
 3. "Industrial clinic examinations (of iron mining employees)"
GEORGE McL. WALDIE, M.D., Director, Department of Industrial Health, the Cleveland Cliffs Iron Company, Ishpeming Hospital, Ishpeming, Michigan.
 4. Industrial Problems
RICHARD D. MUDD, M.D., Medical Director, Chevrolet-Grey Iron Foundry, Division of General Motors Corporation, Saginaw, Michigan.
- Minnesota Public Health Association Annual Meeting
Luncheon, 12:15, Grand Ballroom.

Afternoon Session

Presiding: A. T. LAIRD, M.D., Superintendent, Nopeming Sanatorium, Nopeming, Michigan

1. "Examination of the lungs in recruits"
J. D. ADAMSON, M.D., Winnipeg, Canada
2. "Symposium of choice of x-ray films in tuberculosis work"
"The 4x5 film in Case Finding"—C. C. BIRKELO, M.D., and B. H. DOUGLAS, M.D., Detroit
"The Relative Usefulness of 35 mm. Films in Case Finding"—D. O. N. LINDBERG, M.D., Decatur, Illinois
"The Comparative Value of Chest Roentgenograms made on Films and on Paper"—S. REID WARREN, JR., Moore School of Engineering, Philadelphia
3. General Discussion.

MISSISSIPPI VALLEY CONFERENCE ON TUBERCULOSIS

Friday, October 4, 1940

Morning Session

Presiding: DONALD E. PRATT, Executive Secretary, Missouri Tuberculosis Association, St. Louis, Missouri

1. "Mass testing in rural areas in Manitoba"
EDWARD L. ROSS, M.D., Medical Superintendent, Manitoba Sanatorium Board, Winnipeg, Canada.

2. "Case finding by joint official and non-official cooperation"
C. K. MCCARTHY, M.D., Director, Division of Tuberculosis, Iowa State Department of Health, Director, Co-operative Case-Finding Service, Iowa Tuberculosis Association.
3. "Care of the discharged tuberculosis patient"
W. J. BRYAN, M.D., Superintendent and Medical Director, Rockford Municipal Tuberculosis Sanatorium, Rockford, Illinois.
MISS METTA BEAN, Director, Social Service Department, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wisconsin.
MISS PEARLE J. HELD, Superintendent, Sarahurst Boarding Club, Minneapolis.
4. "Institutional surveys"
5. "A recapitulation of surveys as they affect the local tuberculosis association"
R. G. PATERSON, M.D., Executive Secretary, Ohio Tuberculosis Association, Columbus, Ohio.

MISSISSIPPI VALLEY SANATORIUM ASSOCIATION

Friday, October 4, 1940

Morning Session

Presiding: HAROLD M. CONN, M.D., Superintendent, Wisconsin State Sanatorium, Statesan, Wisconsin

1. "The detection of tubercle bacilli in latent lesions and in normal tissues of the human lung"
WM. H. FELDMAN, D.V.M., and ARCHIE H. BAGGEWSTOSS, M.D., The Mayo Foundation and Clinic, Rochester, Minnesota.
2. "The dissemination of tubercle bacilli in the human spleen and liver."
C. E. WOODRUFF, M.D., and RUBY G. KELLY, Wm. H. Maybury Sanatorium, Northville, Michigan.
3. "Roentgenological-Pathological Conference"
HENRY C. SWEANY, M.D., Medical Director of Research, Municipal Tuberculosis Sanatorium, Chicago, Illinois.

Afternoon Session

Presiding: JOHN B. BARNWELL, M.D., Associate Professor of Medicine, University of Michigan, Ann Arbor, Michigan

1. "The treatment of syphilis in tuberculous patients"
PAUL MURPHY, M.D., and LEON BRAMBURG, M.D., Robert Koch Hospital, St. Louis, Mo.
2. "Pulmonary carcinoma"
EDWIN J. SIMONS, Swansville, Minn.
3. Business meeting
4. "Tuberculosis in public institutions"
H. E. HILLEBOE, M.D., Director of Tuberculosis, Minnesota State Board of Control, Saint Paul, Minn.
5. "Intrapleural pneumonolysis"
Experiences with this Procedure at Nopeming Sanatorium
—G. A. HEDBERG, M.D., Nopeming Sanatorium, Nopeming, Minn.

"SULFATHIAZOLE" AND "SULFAMETHYLTHIAZOLE"

The Council on Pharmacy and Chemistry reports that the terms "sulfathiazole" and "sulfamethylthiazole" are acceptable to Dr. Fosbinder, who is credited as the discoverer of 2-sulfanilamidothiazole and 2-sulfanilamido-4-methylthiazole. Inquiry was also made of Dr. E. J. Crane, chairman of the Committee on Nomenclature of the American Chemical Society, who also informed the Council that, in his opinion, there was no objection to offer to these nonproprietary names. Accordingly, the Council adopted the recommendation of its Committee on Nomenclature that the terms "sulfathiazole" and "sulfamethylthiazole" be accepted as nonproprietary designations for 2-sulfanilamidothiazole and 2-sulfanilamido-4-methylthiazole, respectively. The adoption of these terms does not indicate at this time the acceptance of the substances. (J.A.M.A., June 15, 1940, p. 2387.)

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, January 4, 1940

President, WILLARD D. WHITE, M.D., in the Chair
Secretary, HARVEY NELSON, M.D.

ABDOMINAL PAIN AND ILEUS DUE TO URETERAL CONSTRICTION

Report of Case

CHARLES E. MERKERT, M.D.
Minneapolis

The case that I am presenting is that of a boy who when he first came to me on December 18, 1935, was seven years old.

On his first visit, which was at the office, his mother told me that he had been having attacks of abdominal pain, accompanied by vomiting and fever for the past two years. She said he would have two to three attacks each year, each attack lasting two to four days and then he would be normal again. The present attack had started two days previous and had been accompanied by vomiting. His bowel movements had been normal. There was no urinary burning or frequency. Examination showed normal temperature and pulse. There was moderate rigidity of the abdominal muscles over the whole right side. Maximum tenderness of a moderate amount was just to the right of the navel. There was no abdominal distension. Leukocyte count was 12,000. Urine examination was normal. Three urine examinations over a period of three or four days were all negative. By this time his attack had completely subsided and he was without pain.

Then on June 7, 1936, he had another attack of abdominal pain and vomiting. I saw him early the next day and sent him to Northwestern Hospital. At this time his rigidity and muscle spasm was over the right lower quadrant. Maximum tenderness was just to the right of the navel. Temperature was 99.2; leukocyte count 9,000. A urine specimen examination was normal except for only an occasional pus cell in the centrifuged specimen.

Through a right rectus incision a limited abdominal exploration was done. The appendix was removed and was normal, except for some increase in the amount of lymphoid tissue. No Meckel's diverticulum or evidence of pathology was found.

Within a month following this operation, the patient again had another attack of pain and vomiting, and later that year he had about two more attacks. His mother on my advice, gave him an enema each time which seemed to abort the attacks. I did not see him during this time.

On December 6, 1936, he had an attack of pain all over the abdomen, but more so over the appendectomy scar. This was again accompanied by vomiting. The mother gave him an enema with good results. The next day he still had some pain but felt better in the evening and the vomiting stopped. The day following he had two good bowel movements, but late that night the pain became more severe and he began to vomit again. I saw him the next morning at which time his temperature was 101. His abdomen was doughy in consistency. There was generalized abdominal tenderness of a moderate degree. The patient was listless and looked very sick, which I believed was due to acidosis.

He was sent to the Hospital where on admission Dr. Edward Anderson, pediatrician, was called in consultation. He made a tentative diagnosis, of cyclic vomiting and advised treatment for acidosis by giving glucose and fluids. Hartman's solution was given by hyperdermoclysis. Glucose and saline solutions were

given by vein and by proctoclysis. By the next day, December 10, 1936, he stopped vomiting and felt better.

Next day, December 11, he began to vomit again and a urine specimen revealed some acetone still in the urine. His abdomen became more distended and he had more abdominal pain. His temperature was 102 by rectum and he had a cough. Nasal suction was started and a flat plate of the abdomen was taken showing small bowel obstruction.

The next day the temperature went to 104 by rectum and he was coughing more. There were râles in the left lower chest. Although nasal suction at times seemed to work well, his abdomen remained markedly distended. Enemata of various types including milk and molasses produced some flatus but distension was not relieved. The nasal suction catheter was adjusted, using the x-ray, to determine the position of the tube but still decompression did not result. The patient was delirious at times.

The next morning which was December 13, Dr. Wangenstein was called in consultation and agreed that enterostomy should be done at once. By palpation and auscultation of the abdomen in which he heard borborygmi and tinkling sounds, he stated the obstruction to be of a dynamic rather than a paralytic type.

The patient was taken to the operating room after administration of chloral hydrate by rectum. Under local anesthesia, through a McBurney incision, an enterostomy was done on the first loop of small bowel that presented. This enterostomy was similar to a Witzel gastrostomy, using one catgut stitch to tack the No. 14 French catheter to the bowel wall and interrupted silk sutures to form the bowel peritoneal tunnel.

Bottle suction was applied to the enterostomy tube and this along with nasal suction rapidly decompressed the bowel. Intravenous fluids were increased in amount. A flat plate of the chest at this time revealed some pleural effusion with an atelectasis or pneumonia in the left lower chest. The patient improved and the day after operation passed some flatus. On the second day after operation he had a soft stool. From then on he rapidly improved and left the hospital on January 1, 1937.

On January 19, 1937, a gastro-intestinal x-ray was negative. However, one plate showed an absence of psoas muscle shadow on the right.

On February 11, 1937, an intravenous pyelogram showed a definite right hydronephrosis probably due to ureteral neck obstruction. I recommended cystoscopy followed by operation, but as he was feeling well and had no attacks his parents postponed more surgery at this time.

On July 26, 1938, he had another attack of pain and vomiting. He was immediately brought to the hospital. Dr. Ernest Meland was called in consultation. He inserted a catheter into the right ureter to the pelvis. Retrograde pyelogram showed again the hydronephrosis and also the narrowing of the uretero-pelvic juncture. Removal of the catheter caused recurrence of the pain. It was reinserted and after a few days of drainage, operation was performed.

Under ethylene anesthesia on August 4, 1938, the kidney was exposed. This exposure was difficult due to marked perinephritis. Uretero-pelvic adhesions bound the ureter high upon the pelvis. There was an anomalous artery about 4 mm. in diameter tight across the uretero-pelvic juncture. This artery was very sclerotic and nodular like those of an old man. The artery was clamped and cut. After freeing the ureteral neck

of adhesions it was so narrow that a Y plasty of the Schwyzer-Foley type was done. A few stitches in the kidney capsule were attached to the fascia as nephropexy to place the kidney in a normal position and the wound was closed. A No. 20 catheter had been placed through the kidney, to the pelvis as drainage and a No. 5 ureteral catheter through the kidney, the pelvis and into the ureter to act as a splint.

Except for some urinary infection before and just after leaving the hospital, which responded well to sulfanilamide therapy his recovery was uneventful.

Two months later, on October 28, 1938, intravenous pyelogram showed good function of the kidney but some remaining dilatation of the kidney pelvis.

Last Saturday, December 30, 1939, another intravenous pyelogram again showed good function and the pelvis about the same size.

It is now one year and four months since his operation and during that time has had no pain or vomiting. He has been in excellent health since that time.

The few observations I wish to make are these:

1. With repeated abdominal pain and vomiting in children even in the presence of normal urine, an intravenous pyelogram should be done for diagnosis.
2. Ureteral obstruction in children can produce an ileus either of the paralytic or dynamic type.
3. Y plasty of the uretero-pelvic junction may be necessary even after excision of an obstructing anomalous artery.
4. An anomalous artery under tension may be very sclerotic even in a child.

FRACTURE OF THE SPINE OF THE TIBIA (INTERCONDYLOID EMINENCE)

ERNEST R. ANDERSON, M.D.
Minneapolis

The authors of textbooks on surgery and on fractures are not in agreement as to the treatment and management of fractures of the tibial spine. The condition is dismissed by some as being very simple and others consider it to be a very important fracture because of the possibility of creating a permanent state of disturbed physiology of the knee joint. If an accurate knowledge of the anatomy and a true understanding of the physiology of the knee joint is possessed, an exact diagnosis can be made and rational treatment carried out.

Fracture of the tibial spine was first described by Poncet¹⁹ in 1875. It was a postmortem finding in an individual who died instantly following a fall from a third story window. Dittel,¹⁹ the following year, had a case occurring in a man who had been thrown from a public house. The knee joint became distended with blood and following aspiration became septic. The leg was amputated and the patient died. On postmortem examination, a fractured tibial spine was found.

Goodlee,¹⁹ in 1888, described a case that had occurred in 1873 in the wards of the University College Hospital, London. The specimen was an autopsy finding and had been preserved in the museum of the University College Hospital. Roth,¹⁹ in presenting this subject to the British Orthopedic Association in 1927, demonstrated this specimen.

The condition occurring in a living subject was first described by Pringle¹⁸ in 1907.

The patient, a male aged thirty-six, was injured June 11, 1903, by a severe blow on the outer aspect of the left knee joint. He was knocked down, the left knee being forced inward. He was admitted to the Royal Infirmary, Glasgow, on June 14. The left knee was greatly swollen by the effusion in the joint cavity. The left leg was abnormally abducted at the knee joint. No x-rays were taken of the knee. It was thought that the internal lateral ligament of the left knee was ruptured. No mention was made as to whether extension of the left leg was blocked or not. There was no abnormal anteroposterior movement of the tibia on the femur.

The internal lateral ligament of the knee was exposed on June 26, 1903, and found to be intact. The knee joint was opened and a fracture of the spine of the tibia found. Pringle replaced the fractured tibial spine and sutured it into place.

Following is a report of a case of comminuted fracture of the left tibial spine which was treated in a conservative or non-operative manner producing a very satisfactory result.

A white male, aged twenty-four, while playing basket ball on March 22, 1939, made a sudden stop. He fell forward. In falling the left leg was twisted inward as well as forced medially. He landed with the left leg underneath him. At the time he heard a snap in the left knee. The knee and leg felt numb at first. He was helped to his feet and when he stepped on the left foot the left leg did not support him. He had no pain in the left knee or leg until the knee was moved.

On examination the left knee joint was found to be swollen and fluctuation was present. The left leg was abducted 7 degrees. The leg could passively be completely extended and could be flexed to 90 degrees. There was no abnormal posterior or anterior movement of the tibia on the femur. He had tenderness on the lateral surface of the knee over the interarticular space and over the lateral femoral condyle.

An x-ray of the left knee was taken by Dr. A. G. Allison and a comminuted fracture of both tubercles of the left tibial spine was found. There was a slight displacement of the fragment of the medial tubercle of the tibial spine. X-rays were taken with the knee flexed, these showing the comminuted fracture and an increase in the displacement of the medial tubercle of the tibial spine.

The patient was sent to Asbury Hospital and kept in bed. The knee joint was aspirated daily, 70 c.c., 40 c.c., 23 c.c. and 24 c.c. of bloody fluid were removed on successive days. With the leg completely extended a compression bandage was applied to the knee after each aspiration. On the sixth day following the injury a walking cast was applied from the gluteal fold to the toes on the left leg. The following day he was allowed to walk on the injured leg and discharged from the hospital.

The cast was removed on May 8, 1939. The x-rays taken at that time showed bony union of the lateral tubercle of the tibial spine which was in good position. The fracture line of the medial tubercle of the tibial spine was clearly seen and there was some increase in the density of this fractured fragment with no evidence of union.

The left knee was supported by an Ace bandage and he was instructed to use the left leg. On June 7, 1939, he was walking without support. He had no pain in the left leg or knee and stated that the leg felt strong. The left leg extended at the knee to 180 degrees and flexed so that the posterior surfaces of the leg and thigh came together. There was no relaxation of the ligaments of the knee joint. He returned to work on June 30, 1939.

When he was seen on July 8, 1939, he stated that

he had a sense of confidence in the knee and was able to work his eight-hour shift without having any pain. At this time the motions of the left knee were normal. There was no anterior or posterior movement of the tibia on the femur.

Fracture of the tibial spine does not occur frequently. It is usually associated with other fractures involving the knee joint. The incidence of unassociated fracture of the tibial spine, as reported by different authors, varies.

Swett, McPherson and Pike²² had ten cases of this type included in their study of forty cases of tibial fractures involving the knee joint. Cullovich²² reported three cases occurring in twenty-four fractures of the tibia involving the knee joint. Steuer's²¹ incidence was one case in sixteen. In 5,840 consecutive recent fractures, Clarke³ observed twelve cases in thirty-two tibial fractures involving the knee joint. Kurlander¹⁰ reported three cases in 1,000 fracture cases. In the Massachusetts General Hospital, Barr¹ observed four cases among a total of 4,390 fracture cases.

It is interesting to note that in Swett, McPherson and Pike's²³ study seven of their cases occurred in connection with automobile accidents. They did not mention how many of their fractures were the result of direct blows or twisting injuries. Barr¹ had one case where the fracture was due to a blow in the region of the knee, the remaining three cases being caused by a twisting injury to the knee joint.

To understand this fracture a consideration of the anatomy of the head of the tibia is necessary. The proximal end of the tibia is composed of two articulating surfaces, the medial and lateral condyles. These condyles are separated by a roughened nonarticulating area. The raised portion in the center of this area is the tibial spine or intercondyloid eminence. Situated on the tibial spine are two tubercles: the medial, sometimes referred to as the anterior; and the lateral, which is sometimes called posterior.

Anterior and posterior to the tibial spine there are two flattened surfaces known as the anterior and posterior intercondyloid fossæ. On the anterior intercondyloid fossa are attached the anterior extremities of the medial meniscus, the anterior crucial ligament and the anterior extremity of the lateral meniscus.

The tibial attachment of the anterior crucial ligament is described differently by the various anatomists. Spalteholz's *Atlas*²⁰ states that the attachment is especially on the medial intercondyloid tubercle of the tibial spine, and on the anterior intercondyloid fossa between the anterior points of the fastening of the two menisci.

The anterior crucial ligament is described in Morris' *Human Anatomy*¹⁵ as being attached to the medial half of the fossa in front of the intercondylar eminence of the tibia and to the lateral border of the medial articular facet as far back as the medial intercondyloid tubercle. It is fixed to the tibia behind the anterior extremity of the medial semilunar meniscus. Behind and to the lateral side it has the anterior extremity of the lateral meniscus, a few fibers of

which blend with the lateral edge of the ligament. Its anterior fibers at the tibial end are strongest and longest, being fixed highest on the femur; while the posterior, springing from the intercondyloid eminence, are shorter and more oblique. In Cunningham's *Anatomy*⁴ the anterior cruciate ligament is said to be attached in the rough nonarticulating area in front of the intercondyloid eminence of the tibia. The anterior crucial ligament arises from the depression in front of the spine of the tibia, according to Piersol's *Human Anatomy*.¹¹

Parsons¹⁶ having made a thorough study of the head of the tibia states, "The tibial attachment of the anterior crucial ligament is indicated by a little knob on the outer margin of the internal articular facet. From this the attachment runs transversely outward to about the mid-sagittal line of the tibial head." He describes the medial tubercle of the tibial spine as being free and the anterior crucial ligament as resting against it as it passes backward, upward and laterally from its attachment on the anterior intercondyloid fossa to its attachment on the medial side of the external femoral condyle.

Through the courtesy of Drs. C. M. Jackson and E. A. Boyden of the anatomy department of the University of Minnesota, I dissected and examined sixteen cadaver knee joints. The tibial spine was well defined in all specimens. The medial and lateral tubercles with the intertuberculum sulcus were clearly demarcated.

The tibial attachment of the anterior crucial ligament was found to be a fan shaped area on the anterior intercondyloid fossa along the lateral margin of the medial tibial condyle. The anterior margin of the tibial attachment was consistently about three-fourths of the distance from the tibial spine to the anterior margin of the tibial head. Laterally the margin was usually beyond the mid-sagittal line.

In nine specimens the posterior fibers of the anterior crucial ligament ended on the anterior intercondyloid fossa in front of the base of the medial tubercle. The medial tubercle was free of any attachment. In five specimens the posterior fibers of the anterior crucial ligament fastened to the anterior surface of the medial tubercle. These fibers were not dense and were easily detached. They were not joined firmly with the integral portion of the ligament. In two specimens the posterior fibers of the anterior crucial ligaments were attached along the lateral side of the medial tubercle. The attachment extended backward to the level of the posterior portion of the tubercle. To the anterior intercondyloid fossa were attached the long, dense, strong fibers of the ligament. The fibers that attached to the lateral side of the spine were shorter and angulated from the long axis of the ligament.

In all the specimens dissected the lateral tubercle of the spine was free and had no attachments of any intra-articular structure.

The mechanics for the production of fracture of the tibial spine is one of direct trauma by the condyle or condyles of the femur on the structure. This fracture occurs when the foot is fixed and the femur is forcefully rotated on the tibia, or when the knee is forced medially or laterally, or it could be a combina-

tion of both. In some instances the rotation of the femur on the tibia is the predominant force; while in others the forcing of the femur on the tibia, either in the medial or lateral direction, is the causative force. In forced rotation of the femur the lateral margin of the internal femoral condyle strikes the medial tubercle of the tibial spine and the medial margin of the lateral condyle strikes the lateral tubercle. By the shearing force one or both tubercles of the tibial spine is broken. When a direct force is applied above the interarticular space to the lateral side of the knee, the medial margin of the lateral femoral condyle strikes the lateral tubercle of the tibial spine and fractures it. If the force is sufficient to cause a dislocation of the knee the medial tubercle can also be fractured. With the force directed above the interarticular space against the medial side of the knee, the medial tubercle is struck by the lateral margin of the medial femoral condyle and fractured. The lateral tubercle will be fractured if the force is sufficient to dislocate the knee so that the medial condyle strikes it.

The shearing force as the causative factor in producing tibial spine fractures was recognized by Jones and Smith⁷ as well as an avulsive force produced by the anterior crucial ligament. Webb,²⁴ in describing this fracture in Christopher's Surgery, states that the etiologic factor is the striking of the femoral condyles against the tubercles. Fairbanks,⁵ in discussing this subject before the orthopedic section of the Royal Society of Medicine, differentiated between the true fracture of the tibial spine that resulted from the shearing force, and the fracture caused by the pull of the anterior crucial ligament which produced an avulsion of bone from the tibia in front of the tibial spine in the anterior intercondyloid fossa.

The force that produces this avulsion of bone must be exerted to the tibial attachment of the anterior crucial ligament. The ligament is taut when the knee is extended. The avulsive force is created on hyperextension of the knee. When the knee is in any degree of flexion the anterior crucial ligament relaxes and no avulsive force can be exerted. In view of the fact that the firm tibial attachment of the anterior crucial ligament is not on the tibial spine but on the anterior intercondyloid fossa, the fracture produced on hyperextending the knee is the portion of the fossa in front of the tibial spine. In the case herein reported the fractured medial tubercle of the tibial spine was displaced more when the knee was flexed, that is, when the anterior crucial ligament was relaxed. In extension or hyperextension of the knee the anterior crucial ligament becomes taut and presses down on the medial tubercle exerting a force to replace it. In the case of an avulsive fracture in the tibial attachment of the anterior crucial ligament, extension or hyperextension of the knee causes a pull on the fractured fragment and displaces it from the head of the tibia. Lee²² recognized this fracture and describes his technic for the operative reduction in a paper titled, "Avulsion Fractures of the Tibial Attachments of the Crucial Ligaments."

In knee injuries, a fracture of the tibial spine should be suspected when a rapid distention of the knee joint occurs with the knee held in partial flexion. The distention occurs early and is marked, this being caused by the filling of the joint cavity with blood. Active and passive motions of the knee and weight bearing are painful. The fragments of the fractured tibial spine are in the intercondyloid area and will usually not block the motions of the knee joint. Along with these signs are those resulting from the injury of the collateral ligaments of the knee: namely, tenderness over their attachments; palpation of a depression over the interarticular space if the ligaments are torn; and some degree of abduction of the leg depending on the extent to which collateral ligaments of the knee are injured.

If the tibia can be moved forward on the distal end of the femur while the knee is flexed either at the time of injury or when the knee joint has been aspirated, it speaks for injury involving the anterior crucial ligament. Roentgenographic study will determine if an avulsion fracture of the tibial attachment of the ligament has occurred.

True fractures of the tibial spine are treated conservatively except when the fragments are displaced into the interarticular portion of the joint and cause interference. In that case the fragment acts as a foreign body in the joint and must be removed surgically if manipulation with the knee in flexion does not dislodge the separated portion of the tibial spine. Otherwise, after the knee-joint distention has been controlled by repeated aspirations, the knee is immobilized in complete extension in a plaster-of-Paris cast. With the knee extended, early weight bearing can be employed. The knee should be immobilized for six to eight weeks to allow firm bony union. The injured collateral ligaments of the knee will heal and be solid at the end of the immobilization.

In the case of the avulsion fracture of the tibial attachment of the anterior crucial ligament, reduction should be operative. The fractured tibial fragment should be replaced in the anterior intercondyloid fossa and fixed. This is important because, if the anterior extremity is not anchored, the integrity of the crucial ligament is disturbed and the result is an unstable knee joint. After the operative reduction, the knee joint is immobilized in a plaster-of-Paris cast with the knee partially flexed to relax the anterior crucial ligament. Immobilization should be maintained until firm union of the fracture is obtained.

Summary

1. A case of fracture of the tibial spine is reported.
2. A satisfactory functional and anatomical result was obtained by conservative treatment.
3. The firm tibial attachment of the anterior crucial ligament was found to be in the anterior intercondyloid fossa in sixteen dissected anatomical specimens.
4. Fracture of the tibial spine and avulsion fracture of the tibial attachment of the anterior crucial ligament are separate conditions and should be differentiated.

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ENTERIC INTUSSUSCEPTION IN AN ADULT

Report of a Case

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Intussusception is that condition in which a part of the bowel invaginates itself into an adjacent part. It has been recognized for centuries. The first real description of the condition was made by 16th Century anatomists.

The cause in many cases is unknown. Polyps and tumors, both benign and malignant, have set off the process. Acute appendicitis, Meckel's diverticulum, foreign bodies in the intestinal tract and acute inflammation have also been mentioned as causes. A radical change in diet may be responsible as in two cases reported by Moore.⁴ They were observed during the Mohammedan fasting season when the Mohammedans do not eat or drink between sunrise and sunset. These individuals were seized with symptoms of intussusception at the end of the fast, one after drinking a glass of cold water, the other had taken nothing. Both died. At postmortem examination no cause could

be found for the condition. Other cases have been reported in which the etiology could not be explained.

Most cases of intussusception are in infants under two years of age (80 per cent according to Montgomery).⁷ It is more frequently found in boys than girls, especially in healthy robust boys. It is rare in adults, especially the types in which there is no apparent cause such as polyps or tumors. Davis² of Duluth, reviewed the records of St. Luke's and St. Mary's Hospitals of that city and found that in 113,351 patients, intussusception was present only twenty-two times. There was only one adult in this series. At the Beth-El Hospital, Brooklyn, New York, over an eleven-year period, there were six cases of intussusception in 62,682 admissions, and one of those was an adult. (Finkelstein)⁴

McGlannon⁶ classifies intussusception into 3 groups: (1) enteric (10 per cent); (2) entero-colic (80 per cent); and (3) colic (10 per cent). Usually there is a single invagination. Occasionally, however, there may be a double or even a triple process. Very rarely the invagination may be retrograde. As the infolding process progresses the mesentery is pulled in and the venous blood supply is compromised. Swelling occurs and increases, blood extravasates into the bowel lumen, later the arterial blood is cut off and gangrene occurs. Peritonitis develops and if the process has been slow in forming, occasionally it is walled off, and an abscess may form or the invaginated portion of gut may slough off and pass from the rectum, an autoanastomosis taking place. However, by far the most frequent occurrence is a spreading peritonitis and death, unless surgical relief is obtained. Very rarely an intussusception will unfold itself.

The first symptom is sudden, severe pain in the abdomen as in partial intestinal obstruction. This is intermittent and paroxysmal until complete obstruction or peritonitis occurs. The cramps usually last a few minutes and then let up, only to return again in a short time. The pains are severe, causing the patient to double up. He may assume the knee-elbow position or pull the legs up, trying to obtain relief. The face shows a painful, agonized expression. When obstruction becomes complete, gangrene takes place and the pain is both paroxysmal and continuous. Vomiting usually occurs. The higher the lesion is located the earlier and more frequently vomiting is noted.

The bowels move normally early in the attack, but later no fecal material is passed. However, blood and mucus are usually expelled from the rectum in the entero-colic or colic type, or may be found on the examining finger. In the enteric type, blood is a late sign. The abdomen is not distended early but gradually becomes distended as obstruction becomes more pronounced. Auscultation reveals exaggerated peristaltic sounds until complete obstruction or peritonitis occurs; then there is the silent abdomen. The temperature is normal or subnormal early; later it increases. In the beginning of an attack the white blood count is also normal but as time goes on a leukocytosis is present. Palpation of the abdomen usually reveals tenderness and rigidity over the involved area. Under anesthesia

such as chloral hydrate, a tumor mass may be felt, most often sausage shaped and lying transversely across the abdomen. In many cases a mass may be felt on rectal examination which resembles the cervix uteri. The treatment is non-surgical and surgical. Good results are reported by Hipsley⁵ of Australia from rectal injection of water or saline, but in this country, England and Europe, this method of treatment is thought to be dangerous.

If the lesion is less than a day old a barium enema may be given at low pressure and an attempt made to reduce the mass under fluoroscopic control. This is often successful in the colic or entero-colic types but if there is any doubt as to reduction the abdomen should be opened and this point determined. It is practically impossible to reduce the enteric type by rectal injections. Surgical treatment should be instituted as soon as the diagnosis is made in the enteric type and in the colic and entero-colic ones if the barium enema is unsuccessful.

A rectus incision over the point of tenderness should be made. The lesion is located and reduced by pushing the infolded intestine out. Very little if any traction should be put on the proximal intestine. In early cases reduction is usually easily accomplished. Later it may be difficult or impossible to reduce the intussusception. Warm saline compresses should be placed about damaged intestine and if its color and circulation return, it should be put back in the abdomen and the wound securely closed. If the reduction is impossible or the gut dead, we believe that it should be exteriorized as in the Mikulicz procedure.

In the May, 1939, issue of the *Journal-Lancet*, Dr. Philip A. Anderson and I reported a case of enteric intussusception in a boy four and a half years of age, because of its rarity. On November 26, 1939, Dr. Ralph H. Creighton and I¹ operated on a man fifty-two years of age with an enteric intussusception. Dr. Creighton will now report this case.

The patient, a man aged fifty-one, was seen Sunday evening, November 26, 1939, because of severe, periodic paroxysms of pain in the abdomen. The onset had been extremely sudden, about one hour before he was first seen. There had been nothing unusual about his condition or activities during the day, and the cramps started with no premonitory symptoms, shortly after returning home from an automobile ride. The spasms of pain were periodic, occurring every few minutes with complete relief and relaxation in between, and so severe that he would cry out and roll around in agony as soon as they started. He found some relief in assuming the knee-chest position, or sitting up in bed with his legs flexed tightly against his abdomen and his chin on his knees. His facial expression was agonized and apprehensive. His face was pale and beaded with perspiration. His skin was cold and clammy, almost presenting a picture of shock except for the fact that his pulse was not elevated. With each spasm of pain, there would be moderate nausea, and at times he would regurgitate small amounts of vomitus, always with relief. The vomiting was at no time projectile or fecal in character. There was no history, up to the onset of the present illness, of any gastro-intestinal disturbance, and no constipation. He knew of no foods which had ever given him any distress. The bowels had moved normally about eight

hours previously, but since the pain started, there had been no gas passed nor any tenesmus of the rectum, with passage of mucus. The genito-urinary history was negative. He located the severest pain just below the umbilicus and a little to the left of the midline, although the entire abdomen was somewhat tender to palpation. There was no radiation of pain at all.

Physical examination revealed a subnormal temperature and a normal pulse. He was obviously in extreme pain during each paroxysm, and also quite comfortable and relaxed during the intervals. There was no distention of the abdomen. No masses were felt and there was no spasm of the recti muscles. The point of maximum tenderness was located to the left of the midline in the lower abdomen. Auscultation over the abdomen during pain, revealed sounds of active peristalsis, the gas giving a metallic, tinkling sound. Rectal examination revealed nothing, and there was no pain on Murphy percussion.

A tentative diagnosis of intestinal obstruction, due probably to volvulus, was made. At this time, intussusception was considered because the picture suggested that condition in an infant. This thought was discarded, because of the age of the patient, for the more reasonable assumption of volvulus.

On admission to the hospital, the temperature was found to be 96.4, the pulse 74, and respirations 24. Examination of the urine revealed nothing unusual. The leukocyte count was 9,400, with 83 per cent p.m.n.'s. A flat plate of the abdomen failed to show anything suggestive of obstruction, and gave no other leads to suggest a diagnosis.

Dr. William Jones was called in consultation, and the available evidence was considered. An acute inflammatory condition inside the abdomen was ruled out, but renal colic and diverticulitis were thought to be possibilities. It was agreed that we had no direct indication at that time for exploratory laparotomy. The patient was given $\frac{1}{4}$ gr. of morphine and observation was continued.

He passed an extremely uncomfortable night, although the cramps were not as severe, nor as frequent, as before. He had four or five emeses, although he took a fair quantity of fluids. The next morning, the leukocyte count had risen to 15,900, with 89 per cent p.m.n.'s. This brought an inflammatory condition back into the picture. A second flat plate of the abdomen revealed no more than the previous one had shown. The urine examination was again negative. There did not appear to be any change in the abdominal examination, and there was no distention. The barium enema was considered, and discarded because of the possible risk of rupturing an acutely inflamed diverticulum. Hot stupes were used during the day, but were discontinued because their weight caused discomfort. Two enemata were given without success. Little change occurred throughout the day or night.

Tuesday morning, about thirty-eight hours after admission, his condition became as severe as on admission. The bouts of pain came on every few minutes, accompanied by vomiting of small amounts. The vomiting always seemed to bring relief. He again assumed the fetal position to relieve the pain, and now, for the first time, the abdomen began to be distended. No gas or feces had been passed since the onset. There was still no spasticity of the recti muscles, and no mass was felt. The temperature was still normal, but the pulse had risen to 120. The leukocyte count was 14,600, with 87 per cent p.m.n.'s. He looked much more ill than he had on the previous day. Intravenous administration of 5 per cent glucose in normal saline was started, and an immediate barium enema was ordered.

The barium was administered under fluoroscopic control, and passed all the way into the cecum, which was well filled. The colon was found to be entirely normal. Plates, however, showed a marked "laddering" of the small bowel and indicated a definite and marked ob-

struction of the lower ileum, distal to the cecum. Immediate laparotomy was advised and accepted.

A left rectus incision was made. As soon as the peritoneum was opened, a considerable amount of thin, chocolate colored fluid was found free in the peritoneal cavity. As soon as the peritoneal opening was completed, coils of small bowel pushed out of the opening, and an obvious intussusception reduced itself without manipulation. About three feet of mid-ileum was found to have been intussuscepted. The intussuscepiens was edematous, mahogany colored, and covered with petichiae. The intussusceptum was pallid and ribbon flat. There was no evidence of any tumor or other mass in the lumen of the ileum, nor did there appear to be any other pathology present. Warm saline packs were used, and since the bowel appeared viable and no suggestion of mesenteric damage was present, the abdomen was closed.

Intravenous fluids were started on return to his room, and were continued until fluids were tolerated by mouth. He was given a total minimum of 3,000 c.c. in twenty-four hours. There was no postoperative distention at any time, and no vomiting. He started to pass gas by rectal tube the following morning. He needed very little sedation the first twenty-four hours, and none after that. On his second postoperative day he demanded food and cigarettes, it being Thanksgiving Day. An enema was given on the fourth day, with the passage of a large, soft formed stool. The remainder of his stay in the hospital was uneventful, and he was discharged on the eleventh day. There has been no trouble of any kind since.

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PADGETT'S DERMATOME AND SPLIT SKIN GRAFTS

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Dr. H. O. McPheeters discussed skin grafts and the use of the Padgett Dermatome. After a discussion of the subject of skin grafts in general and the indications and uses of each particular type and thickness he demonstrated the Padgett Dermatome, an instrument for the taking of grafts of uniform thickness and of any thickness desired.

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desired thickness and with perfect uniformity even to the full thickness of the skin. The skin will regenerate and develop over the donor area from the deeper layers of the skin, as the base of the papillæ are left in any graft up to the full thickness. In this way no further care is needed for the donor area than the simple first dressing. Dr. McPheeters preferred the perforated cellophane over the donor area sealed along the edges with mastasol to support the tension and avoid pull on the raw area. Pressure over this will help stop the oozing and the serum from the cut surface will come through the perforations. The cellophane is not changed for ten days.

He emphasized that the same precautions should be taken with the area to be grafted as with other methods. It is useless to place a graft over any area not prepared, not sterile, with sloughing tissue still present and with poor or not good granulations present. Following the placing of the graft it is imperative to hold it immobilized and with firm, steady pressure on it for about five days. This can be accomplished by the use of large sea sponges or a firm grade of rubber sponge placed over much fluffed gauze. The dressing and sponges should be moistened with normal saline every four hours.

WAR AND TUBERCULOSIS

War . . . makes pleasant news for the tubercle bacillus. As the deaths from T.N.T. increase, those from tuberculosis lag not far behind. In the World War all countries showed this phenomenon whether under arms or not. What effect on our efforts to eradicate tuberculosis will these grim months ahead bring forth? . . . Unless we find a way to redouble the offensive against our hidden enemy, the sad story of twenty years ago will be told again and we will find ourselves facing a record of lost ground.

—KENDALL EMERSON, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

NEOPLASTIC DISEASES. A Treatise on Tumors. Fourth Edition. James Ewing, A.M., M.D., Sc.D., LL.D., Professor of Oncology at Cornell University Medical School, New York; Consulting Pathologist, Memorial Hospital. 1160 pages. Illus. Price, \$14.00, cloth. Philadelphia: W. B. Saunders Co., 1940.

MEDICAL NURSING. Edgar Hull, M.D., F.A.C.P. Clinical Professor of Medicine, Louisiana State University School of Medicine; Visiting Physician, Charity Hospital, New Orleans. Christine Wright, R.N., B.S. Graduate of Davis-Fischer Sanitarium, Atlanta, Ga.; Instructor of Nursing Arts, Charity Hospital School of Nursing, New Orleans; Public Health Nursing St. Mary Parish Health Unit and Experience Center, Franklyn, La. Ann B. Eyl, B.S., Assistant Dietitian, Cook County School of Nursing, Chicago; formerly Instructor in Home Economics, University of Kentucky; Therapeutic Dietitian Charity Hospital of Louisiana, New Orleans; Dietitian St. Vincent's Infirmary, Little Rock, Ark. 588 pages. Illus. Price, \$3.50, cloth. Philadelphia: F. A. Davis Co., 1940.

SYNOPSIS OF THE PRINCIPLES OF SURGERY. Jacob K. Berman, A.B., M.D., F.A.C.S. Assistant Professor of Surgery, Indiana University School of Medicine, Indianapolis. 615 pages. Illus. Price, \$5.00, flexible binding. St. Louis: C. V. Mosby Co., 1940.

CLINICAL HEART DISEASE. Second Edition. Samuel A. Levine, M.D., F.A.C.P. Assistant Professor of Medicine, Harvard Medical School; Senior Associate in Medicine, Peter Bent Brigham Hospital, Boston; Consultant Cardiologist Newton Hospital; Physician New England Baptist Hospital, Boston. 495 pages. Illus. Price, \$6.00, cloth. Philadelphia: W. B. Saunders Co., 1940.



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MINNESOTA MEDICINE

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AN AMERICAN HEALTH PROGRAM*

NATHAN B. VAN ETEN, M.D.
New York City

AWAY back in the era of Babylonian culture, practitioners of healing arts were compelled to organize themselves for the protection of the public from the deceptions of charlatans, quacks and fakirs.

Living under various codes, a cohesive idealism carried them through the centuries—until about two thousand years ago medical organizations were crystalized by the followers of Hippocrates, and the altruistic traditions of the Hippocratic Code have been cherished with rare fidelity. The Hippocratic Code has survived the explosions of successive theories of the science of medicine and still lives as the foundation of medical ethics.

Within a few weeks thousands of young graduates from medical schools in America will listen to a reading of this ancient document and will raise their right hands and swear to uphold it. Very few of them will fail to keep this obligation as their consecration to the service of the sick.

However divergent their ideas concerning the manner of this service, all physicians stand firmly upon this ancient rock.

The evolution of organized medicine in America dates from the founding of the first hospital—by Benjamin Franklin in 1752 in Philadelphia. A group of physicians forming themselves into a hospital staff merged their individualities into an organization which promised to deliver medical care to the sick poor. Soon afterwards medical societies and medical colleges were started and American medical education began to replace European medical education.

All of these establishments represented local efforts working independently. Consequently

there were very uneven standards of quality until the organization of the American Medical Association in 1846, when a federation of medical societies was erected and a serious attempt was made to bring the levels of education and of the practice of medicine up to the highest known standards of the time. The American Medical Association has worked at this job steadily through its councils on Medical Education and Hospitals and on Pharmacy and Chemistry.

Its Judicial Council has jealously guarded the ethics of all practitioners and has been a constant stimulant to an unflinching idealism.

The democratic organization of the American Medical Association gives each one of its one hundred and sixteen thousand members a voice in its affairs. Its House of Delegates, representing every state and territory, originates and strengthens its policies, and elects officers who are obligated to obey its mandates.

As a direct result of ninety-four years of hard work, medical education and medical service in America is the best in the world. Health statistics are unsurpassed and constantly improving. In spite of this undisputed record there are political theorists and imitative philosophers who would substitute European systems of health administration for this American evolution which has such rich vitality and promises still greater attainments through devoted services to the American people.

Contrast the American with the European scene. Germany is no longer the mecca for advanced education. The masters have been driven out by the lash of paganism and medical education has lapsed below mediocrity. The medical course was cut to two years in 1939 and quacks

*Address given before the House of Delegates at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 21, 1940.

and nature healers were legalized. For more than half a century compulsory health insurance has been destroying initiative, and the high quality of German medicine is a matter of history. Mass medicine is poor medicine—red tape makes a poor surgical dressing.

In spite of more than a half century of poorer and poorer medical care which has been endured by the German people, who have been under the heel of one form of autocracy after another, I do not believe that the German scientific spirit can be crushed. Too long Germans have been good students and have given humanity epoch making discoveries of the greatest magnitude. Even now out of this most depressing European mess has come the unfolding of chemotherapy in the instance of sulfanilamide. Germans discovered it, French students developed it, English and Danes and Americans are perfecting it.

Let us hope that honest scientific effort will restore to the German people the right to be considered human beings instead of herded cattle.

Our present American success is the accomplishment of professionals working in a liberal democracy—physicians and other scientists who work at it every day, but who are neither satisfied nor complacent about it. American physicians want to make American medicine so much better that there can be no justice in stories of neglected people anywhere in this country; that there can be no justice to support claims that thousands of people suffer and die from diseases that are curable and preventable; that thousands of young mothers die from lack of medical care; and that thousands of children fail to grow to strong maturity because of failure of medical social technics.

All American physicians know that large numbers of people live miserably because they lack proper food and shelter and are consequently poor health hazards. They know that thousands of city dwellers are so crowded into vile tenements that they are denied healthy decencies.

Are American physicians sufficiently aroused to enter upon active local crusades against local pestilence? The doctor must take more than a superficial interest in local political machinery if he would improve the health and happiness of his community.

Community units are the foundation stones of this democracy. The doctor can be a potent force in making these stones strong enough to carry a

civilized structure. The general practitioner is one of the most valuable citizens of this republic. His potentialities for leadership must be revitalized. He must regain his old place as counselor and confessor and the people must demand his leadership.

By and large the general practitioner is competent and conscientious, and while his continuing education is necessary, our greatest problem in this country is a continuous campaign of public education to make our citizens so health conscious that they will seek early treatment while cure is possible and while catastrophies may be prevented.

Education has consistently lowered the mortality from tuberculosis. Education has salvaged thousands of children from destruction by diphtheria and other communicable diseases.

Public health education must be furthered in personal hygiene; in values of foods; in values of sanitary housing; in social hygiene, in the prevention of destructive disease through venereal infection, in eugenics (in thoughtful human mating); in serious study of social science with the hope of reducing the number of insane who fill more hospital beds than all sufferers from all other diseases; in study of the whole man by all practitioners of healing arts and study of the individual in his home and diagnosis of his illnesses and treatment of them on the spot. Investigative thinking upon all of these problems by all our citizens would undoubtedly yield incalculably large dividends in the health of the American people.

Medical organizations have been working for years to improve the quality of medical service and I believe that they will continue to carry on their concerted efforts to save our people from quacks and incompetents in spite of accusations of criminal violations of business laws. Physicians are learned professionals giving service regardless of fee. They are not merchants of health selling medicines, or formulæ, or instruments, or cures. They are so earnest in the quest for means to relieve human suffering that they give their discoveries freely to all the world. They have no desire to restrain any one in the pursuit of their ideals, providing they are doing it honestly, in conformity with established ethical standards and in the best interest of the sick. They are the privileged servants of the sick and the fee is not their master. They are not in busi-

ness. They are in a large sense educators of the public conscience. They are valuable leaven in the ferment of social progress.

For twenty centuries their adherence to the Hippocratic tradition has led them to survive the crashings of many civilizations. This spirit will carry them to continued distinguished service long after the legal technicians have strutted their brief moments in the limelight and have been forgotten.

Readjustments will be made of professional activities in order to digest unpalatable and reactionary theories of public service.

The profession of medicine, including dentistry, and the professions of law and the ministry of religion will rise above persecutory technicalities and in their honest pursuits will continue to raise the level of general understanding of moral and physical values in the United States.

These professions will continue to try to serve at all social levels to the best of their ability. They will not refuse to work at night or Saturdays or on Sundays or holidays. Their ears will not be deaf to cries for help before nine in the morning or after five in the afternoon. They will continue to need public support, but they will not relax their efforts even if the public fails them. They will exercise a priestly privilege to try to lead American citizens to a high appreciation of their good fortune in living in an advanced democracy—a democracy created by the genius of George Washington, guided by the scientific genius of Benjamin Franklin and the organization genius of Thomas Jefferson, who must have thought of the health of the people when he advocated life, liberty and the pursuit of happiness.

I hope and believe that the professions will keep that popular demand nailed to the masthead and that it will still be flying there when your children's grandchildren come into their inheritance and that it will inspire them to continue the processes of evolution to the realization of physical, mental and moral health for the American people.

American physicians are justified in a pride of conquest over disease, but they must not rest upon their laurels.

While new low percentages are reported for tuberculosis, for diphtheria, for the casualties of maternity and for all diseases of children, the statistics of degenerative diseases, of insanity and of preventable communicable disease cannot be

taken lightly. Too many hearts are breaking under modern strains—too many people between the ages of thirty-five and sixty-five are limping along with incapacities—too many cases of smallpox, nearly fifteen thousand in the United States last year and increasing at an alarming rate because public health authority is not obeyed.

General paresis and other syphilis of the central nervous system accounts for a very large proportion of the tenants of our state institutions, every one of which is crowded from ten to fourteen per cent beyond normal capacity. These and contributing economic conditions are stirring the medical profession to demand new organization of health services for the American people, and are expressed in the new platform of the American Medical Association.

Every word of that platform is objective. The false accusations that the American Medical Association is static and reactionary are sharply denied in its letter and spirit.

Two thoughts are expressed which may seem sharply contradictory—one is *centralization* of all governmental health activities in one new department, and the other is *decentralization* of all other health activities into local units of administration.

Coördination of governmental health activities is simply a practical move to do away with much overlapping expense and reduction of duplicating machinery.

Developing local health units may be a device to find sickness where it is and treat it on the spot, shorten governmental procedures and keep the government out of medical practice.

Wherever local problems can be solved, they lessen the mass of national responsibility. If we settle minor problems we shall have few major problems.

The platform deals in generalities. Specific provisions for detailed development will have to be studied with care by all who are interested, such as the professions of medicine, public health nursing and welfare organizations. A great deal of laboratory work is needed. Suggestions might well be made by legislative bodies such as yours.

The essentials of this new platform are coördination of government health functions; governmental provision of funds for disease prevention and relief of uncared for sickness on proof of need; development of local responsibility for local demand, and local control of administra-

tion; and encouragement of the private practice of medicine as far as possible in harmony with maintenance of a good quality of medical care.

In 1875 the American Medical Association asked for a secretary of health in the cabinet of the President and has timidly restated its desires at various sessions of the House of Delegates—after which the delegates went home to practice medicine and forgot about it.

Last year in the first session of the present congress on March 6, 1939, Mr. Pfeifer introduced a bill No. H.R. 4791—"To establish a Department of Health." This bill was referred to the Committee on Expenditures in the Executive Department, where it still reposes. It was, however, a first step in the National House of Representatives toward coördinating the health functions of our National Administration, which are now scattered through many separate bureaus and major departments.

If local health departments have proved their value—if state health departments have become indispensable—why has a national health department been so long postponed?

Coördination of all federal health agencies except those of the Army and Navy seems logical. The health of our people should be the honest concern of the chief executive. And the health authority should be a member of his cabinet.

I would like to see a new national department to be known as the Department of Health headed by a secretary who must have had a medical education and be licensed to practice medicine. I would like this new department to include the following bureaus:

1. Public health
2. Infancy and maternal welfare to be transferred from the Labor Department
3. Rehabilitation of veterans
4. Research
5. Licensure
6. Care of indigents
7. And other divisions to care for all other health responsibilities, fusing all departments into one less expensive to operate and eliminating the confusion of overlapping and duplication.

I believe the President should have the benefit of scientific advice in Health and Hygiene within his official family.

Defense against disease is quite as important

as defense against the ideas and domination of foreign enemies.

It seems to me to be timely to drop complicated and slipshod methods and attack the problem courageously and efficiently.

Infancy and maternal welfare developed in the Department of Labor in response to wide outcry against child labor. Its objective has been largely realized and now requires a wider and more general type of direction.

Rehabilitation of veterans, developed with well known administration scandal, under a stimulated emotional campaign, is now well established. Hospitals are widespread and may well have a broader significance with the passing of time under a department of health.

Appropriations for research are now vested in the bureaus of Public Health and in appointed committees. I believe that the value of such work would be greatly enhanced if these studies were coördinated in a Department of Health, where voluntary agencies, such as medical schools, voluntary hospitals and philanthropic foundations could coöperate in directly helpful service for the information of the government.

The National Board of Medical Examiners might fit into a function of a National Health Department.

Medical care of indigency looms as one of the most important functions of government. A concert between local agencies through some new type of local, state and national machinery could well be headed in a National Health Department.

The migrating indigent is one of those for whom no local agency is willing to assume the responsibility. He is pushed from state to state and travels from one seasonal employment to another.

No health insurance scheme can take care of such people who can make no regular contribution to any compulsory or government financing. Their care must be centralized. Would there be a better place for this work than in a National Health Department?

It would seem to be ideal to choose a career man to head this department; some one who has been developed through the present department of Public Health or through service in some of the state administrations.

Examination of the current personnel in the various states shows a real need for competent health officers.

Service in the various fields of public health should be carried on by career persons who should be developed through a special training beyond the ordinary undergraduate course in medicine.

Although it must always be borne in mind that a period of private practice seems to be necessary for understanding intimate personal medical problems, there is reason to feel that those who are to direct public health administration should be specially trained in the science of administration before entering such a field. Too often the health officer is merely a political appointee because he has influential friends rather than because he knows anything about the duties of the office. He should also be made conscious of the fact that he is only an administrator and not a practitioner of medicine.

The public consequence of private practice may need government umpiring, but government participation in private practice must not be tolerated.

I believe that the secretary of health should be a physician who has had enough experience in the practice of medicine to know the viewpoint of the patient as well as that of the physician. He should not be a political theorist who cannot know medical care of the sick because he has never practiced it.

There is evidence of a concerted drive for a general service to the sick, both preventive and curative, supported by taxation and under government control.

There is frequent reiteration of a desire for free medical care, patterned after free public education: all doctors salaried by the state—a complete system for state medicine. There seems to be no limit to the belief that the public purse will be able to pay for it, even in the presence of evidence that state education is already too costly for the public pocket, regardless of the fact that school budgets are now the subject of acrimonious debate and regardless of the mounting national deficit.

In the state of New York last year state education absorbed 43 per cent of the state budget of \$385,000,000. State education takes care of people from the ages of five to twenty-one only, while state medicine would involve the care of people from before birth to interment.

Prohibitive cost means nothing to some political theorists.

A new program must provide something better and simpler than these excursions into Utopia.

I believe that needs for help should be discovered in the smallest political subdivision such as the school district, then referred to the township, to the county, to the state, to the federal authority in that order and that the federal authority should be called upon as infrequently as possible.

I believe that medical service to the economic indigent is the problem of the taxpayer. The economic indigent may be defined as one who is unable to provide the necessities of life for himself and his family.

I believe that medical service to the medical indigent is the problem of the taxpayer. The medical indigent may be defined as one who cannot pay for medical care without sacrificing the necessities of life for himself and his family.

I believe that medical service to these two classes of people should be administered by the medical profession and that the physicians who do this work should be paid by the taxpayer.

I believe that medical service to other people of low income who are able to pay for ordinary but not for catastrophic illnesses should be *shared* by the medical profession and the taxpayer. The medical profession and the taxpayer should provide such needed medical service in tax supported institutions either free or at minimum rates.

I believe that new mechanisms for caring for the health needs of the people involving all political subdivisions from the locality to the federal government should be developed no faster than administrative personnel can be sufficiently trained to be effective.

I believe that preventive medicine, although largely a public health problem involving the control of communicable disease, should be promoted by all practicing physicians, upon whom should be imposed definite civic responsibility.

I believe that every effort should be made to provide for the average man so that he can prepare for emergencies without throwing himself upon the sources of charity.

I believe that budgeting for sickness through insurance providing cash indemnity should be encouraged—as well as insurance against the cost of hospitalization, but that these two forms of insurance should be separate projects.

Compulsory systems of sickness insurance as now operating do not take care of indigents and

are only interested in workers who pay for insurance of this type through payroll deductions.

I believe that the sentiments of groups of religionists who object to compulsory medical care through insurance or otherwise, should be respected so long as their beliefs do not jeopardize the public health through neglect of ordinary health precautions for themselves or the community.

Neither creed nor race nor color should deprive any American of the benefits of the best of clinical medicine, but the manner of its delivery should evolve from simple formulæ. The formulæ should grow from the needs of the people as recognized by the family physician, the public health nurse and local welfare workers. The formulæ should grow into workable being in an orderly way which will require a period of time for short steps before long strides are taken. Much laboratory work must be done, as recognized by the President in his recent proposal to build small hospitals in regions where they are needed. This proposal is in harmony with the new platform of the American Medical Association. It is a sane alternative to the extravagances of the proposed Wagner Health Act. It is a stimulant to local initiative to operate a facility erected by the government for the benefit of the locality. It is also in harmony with the President's private statement on more than one occasion that he is opposed to any extensions of state medicine that can be avoided. It is an immediate forward step toward correcting faulty distribution of medical facilities and may prove as attractive as are many hospitals to young physicians who may be seeking new locations.

The memory of an internship in a hospital furnishing every convenient facility is often disturbing to a young doctor's response to calls to country practices where he must be self dependent.

It is to be hoped that these new hospitals will be placed in response to well established local needs.

At the invitation of the President, a committee from the American Hospital Association, from the Catholic Hospital Association, from the Protestant Hospital Association and the American Medical Association met the President at the White House on January 10.

The committee reports that the President seems to be opposed to the enactment of the Wagner Bill and apparently intends to propose to Con-

gress that a sum approximating \$10,000,000 be appropriated for the purpose of building small hospitals in places where there appears to be great need of hospital facilities. Under the plan proposed by the President, the federal government will build the hospitals, but the community, with or without state aid, will be required to maintain these institutions. The President stated that such hospitals when built will not be placed in undue competition with other hospitals. There was little discussion of details at the conference, though some felt that there should have been more such discussion since the practicalities of the situation seemed to demand it.

Although the medical profession is favorably impressed there has been some expression of fear that the President's proposition is but a stepping stone to the all-inclusive health measure introduced in the Senate last year by Senator Wagner which is still resting in the Committee on Education, where it is supposed to be undergoing revision and is not likely to appear at this session of Congress. In fact, Senator Wagner stated publicly at a meeting in New York on March 28 that revision of the bill was proceeding to harmonize it with the ideas of the American Medical Association. Exactly what is meant by that statement is not known, but it is certain that S-1620 has been sidetracked to allow precedence of the President's program for small hospitals.

It is interesting to note a growing interest in and support of the new program of the American Medical Association. Senator Taft has expressed the hope that the Medical Association or some of its friends would introduce a bill into Congress embodying these basic principles. Other legislators have joined in the opinion that this is desirable. Senator Burke violently opposed the Wagner Health program. From a powerful force within the administration has come the utterance of the Federal Security Administrator, the Honorable Paul McNutt. Speaking before the National Health Council on February 15, 1940, I quote a few paragraphs from his speech which reflect a new line of thought in Washington:

"No program addressed to a few diseases or a few age groups, or a few economic groups can possibly reach our ultimate objective which must be to attain the highest possible level of health for all of our people.

"One important means of reaching this objective is the unification and coördination of health agencies at

the federal, state and local levels. The American Medical Association and the American Public Health Association have recommended the integration of health services at the federal level under one cabinet officer, preferably a secretary of health. A first step has already been made toward functional coordination by the creation of the Federal Security Agency of which it is my privilege to be administrator.

Functionally, the agency is the beginning of a combined department of health, education, and social welfare. There still remain departments of the federal government, although these same activities in the states are administered by a single agency. Our objective must be to attain such integration of health activities that we shall no longer deal with human beings as cases of infectious disease or cancer or pneumonia, as sick babies or sick youths or sick old people, but as whole individuals living in families that make up the 130 million people of the United States of America.

"There has been general agreement as to the objectives of the National Health Bill (S. 1620), but some question as to the sums of money involved and considerable criticism of its administrative provisions. Frankly, as an administrator, I have been seriously disturbed by the dispersion of federal administration proposed in this bill. As you know, the bill gives responsibility to the Children's Bureau for medical care of children, to the Public Health Service for medical care of certain high cost illnesses, and to the Social Security Board for diseases other than those for which the Public Health Service is given responsibility.

"It is my firm belief that the first objective of the bill should be to coordinate the Federal health services. I fail to see how a national health program can be administered adequately with three federal bureaus making grants for the control of different diseases and different groups of the population. Confusion and duplication of effort is bound to result at federal, state and local levels. Not the least confused will be the ultimate beneficiary, whose health problems are artificially segregated according to his age and the nature of his illness."

General activity to stimulate legislation forming a National Health Department under a secretary of health must proceed if the medical profession really desires it. Local work must proceed in our county medical societies to promote local action.

It would be ideal if all county societies would start a study of local needs for medical service. There must be wide divergence of local conditions such as the character of terrain, hilly country, flat country, good or bad roads, bridges over rivers, and general accessibility of doctors and hospitals. Much might be done if there was enough ambulance service at strategic points. I learned very early in my career, from my father who was a railroad surgeon, that patients who were

very sick could endure a good deal of transportation.

When Herman Biggs was health commissioner of the state of New York, he advocated a system of cottage hospitals and laboratories to take care of the rural problem in the state of New York. At a hearing before Governor Smith everybody seemed to favor the project. When the governor said he would like to hear what some country doctor thought about it, finally a doctor from Malone, a town in the northern part of the Adirondacks, arose and said, "Well, Governor, in the summer time the Adirondack region is full of city people and there are plenty of city doctors to take care of them, but in winter very few people are there and the country doctors and country towns have plenty of facilities, all we ask you to do, Governor, is to keep the roads open."

The cottage hospitals were not built. Good roads in the state of New York have largely eliminated the rural problem—there is now a doctor in New York state within thirty minutes of every citizen.

Every county society should be interested to make these studies sincerely. It is important to know whether the county needs hospitals, ambulances, doctors, nurses or welfare workers—whether it can take care of itself or needs state or national financial help.

I presume that doctors in Minnesota are just as much or as little concerned in general health problems, are just as generous or as selfish as doctors in other parts of our country. I presume that in each of your counties a *few* doctors do all the work of your county societies and the others are perfectly willing to let them do it.

Of course, you gentlemen here today are the workers of the Minnesota State Medical Society. I wonder if you take yourselves seriously enough to carry back to every doctor in your counties the real importance for every one of them of cooperation, if we are to bring American medicine to its rightful place in American life.

Every doctor in Minnesota should be a citizen in every sense that citizenship means or implies.

The general practitioner must be revitalized into active leadership of all local political movements concerned with the moral, mental and physical welfare of every citizen of this important state.

We must not take negative positions at a time like this when all sorts of wild theorists are

shouting into the public ear. The public seem to be eager for health education and we must give it to them honestly and freely if we really want America to be a better and happier place in which to live.

The American Health Program has been writing itself for one hundred and eighty-eight years.

The American Medical Association has been

motorizing this program for the last ninety-four years cherishing an ambition not only to conserve all of the verities and values of this medical service evolution, but the projection of them into new objectives for the delivery of better and better medical services to the American people.

If American physicians must have an objective slogan, let it be "Better Medical Care for Every American Citizen."

THE ROENTGENOLOGIC DIAGNOSIS OF INTRASPINAL PROTRUSION OF INTERVERTEBRAL DISKS*

JOHN D. CAMP, M.D.
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WITHIN the past few years considerable literature concerning intraspinal protrusion of the intervertebral disks has appeared and the condition has been firmly established as a definite clinical and pathologic entity. Studies by Deucher and Love indicate that the protruded fragments are composed of fibrocartilage, portions of the nucleus pulposus and occasionally remnants of the notochord. These structures are not ordinarily opaque to roentgen rays and cannot be demonstrated per se in plain roentgenograms. Bone or calcium in quantities gross enough to be revealed roentgenographically is so rare in these protrusions that it is of little practical diagnostic importance.

It would seem that in any condition such as this, in which trauma is such a common etiologic factor, there should be visible in plain roentgenograms some alteration in the structure of the bone or joint that would denote the site of the lesion. Experience with a large number of cases, however, does not bear out this supposition. Narrowing of the intervertebral space at the site of a protruded disk was present in only 31.9 per cent of a recent series of cases. Since similar narrowing may also result from degeneration and fibrosis of an intervertebral disk without protrusion, this change alone without other evidence is only of suggestive value.

Hypertrophic changes localized about the margins of an intervertebral space at the site of a protruded disk occur in such a small percentage of

cases (10 per cent) that they are of little help in the direct localization of a protruded intervertebral disk. Compression fractures of a vertebral body contiguous to the site of a protruded intervertebral disk are not common.

Since plain roentgenograms offer little aid in the recognition of a protruded intervertebral disk, the roentgenologist is dependent on the use of some contrast agent for the indirect visualization of the protrusion. Several such agents, namely, iodized oil, air, oxygen, skiodan and colloidal thorium dioxide have been employed for visualization of the spinal subarachnoid space. Each of these substances has certain advantages and disadvantages; none of them so far has proved ideal. Increasing familiarity with the history and neurologic examination in cases of protruded intervertebral disks indicates that in a fair proportion of cases the diagnosis and localization of the protrusion can be made clinically without resorting to any contrast agent. With this improvement in clinical diagnostic acumen the necessity for the use of a contrast agent will probably diminish and be reserved for those cases in which the diagnosis is in doubt and those in which it is desirable to know precisely the anatomic level of the lesion for the guidance of the neurosurgeon.

Iodized Oil Myelography

To date, iodized oil has been used more than any other opaque contrast agent for the roentgenologic visualization of the spinal subarachnoid space. When employed under proper circumstances it has resulted in an accuracy of di-

*From the Section on Roentgenology, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 22 to 24, 1940.

agnosis that is shared by few other roentgenologic procedures. The chief objections to the use of iodized oil are that it is more or less an irritant to the meninges and is contraindicated in the presence of inflammatory disease. The significance of the irritative action, and the effect of its presence within the subarachnoid space have been discussed pro and con in the literature for some years. Nevertheless, it is the consensus of observers who have used it in a large number of cases, that in properly selected cases the advantages of its use far outweigh any disadvantages that are known. The indiscriminate use of iodized oil in cases of low back pain or sciatic pain is not recommended. No contrast agent should be used unless the clinical and neurologic examination indicates the possible presence of an intraspinal lesion that cannot be localized by ordinary clinical procedures.

The lumbar injection of iodized oil is preferred because it is easier and safer to carry out than cisternal puncture. It is important that the iodized oil be clear, transparent and only faintly yellow before use. Small amounts of iodized oil (0.2 to 2 c.c.) may suffice for the localization of lesions that completely obstruct the canal, but in the interest of early diagnosis and for the localization of lesions before obstruction has occurred, it is necessary to use a quantity of iodized oil sufficient to fill the subarachnoid space at any desired level. In my experience 5 c.c. is the optimal amount for this purpose. Some lesions can be shown with smaller quantities, but on the other hand, a number of surprisingly large lesions, and, in particular, multiple lesions, are easily overlooked if amounts less than 5 c.c. are used.

It is desirable that the roentgenologic study be carried out as soon after the injection as possible, as delayed examination and movements of the patient may lead to separation of the mass and droplet formation. A tilting, fluoroscopic table with appropriate foot and shoulder rests is necessary. If the result of the examination of the lumbar spinal subarachnoid space is negative, it is important to examine the subarachnoid space higher up as recent observations have revealed that 50 per cent of patients with tumors of the spinal cord situated in the thoracic region and 30 per cent of patients with such tumors situated in the cervical region have low back pain, or sciatic pain or both as associated or coincidental symptoms. Quantities of iodized oil less than 5 c.c. are

not practical for this phase of the examination.

The deformity of the iodized oil shadow resulting from a protruded intervertebral disk is influenced by the following factors: (1) the posi-

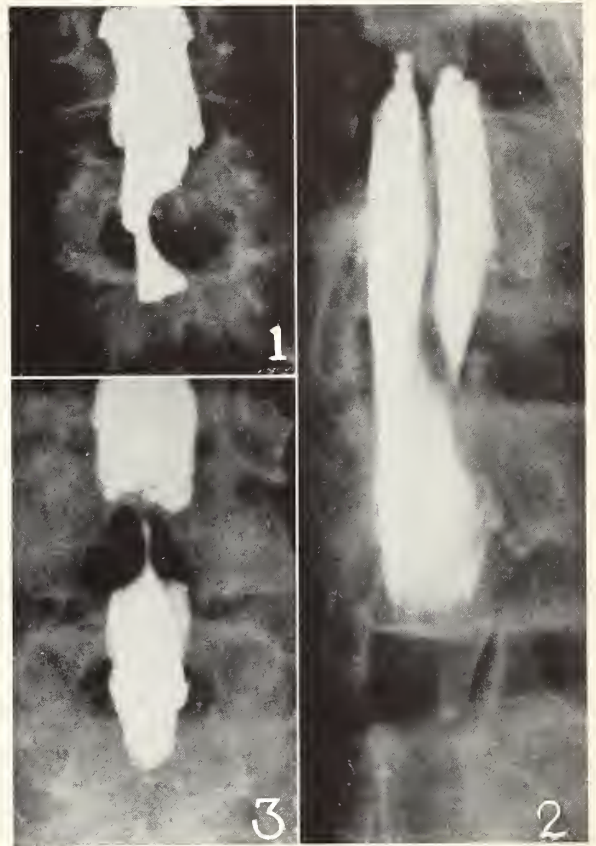


Fig. 1. Intraspinal protrusion of the lumbosacral intervertebral disk. Characteristic unilateral deformity of iodized oil shadow.

Fig. 2. Intraspinal protrusion of the intervertebral disk between the second and third lumbar vertebrae. At the point of obstruction, the shadows of the nerve roots are displaced and compressed by the protrusion. The vertical elongated shadow of diminished density indicates an edematous nerve root, in this case the left second lumbar root.

Fig. 3. Intraspinal protrusion of the intervertebral disk between the fourth and fifth lumbar vertebrae. Bilateral deformity of the iodized oil shadow.

tion of the protrusion, (2) size of the protrusion, (3) associated hypertrophy of the ligamentum flavum, (4) changes in the nerve roots (displacement, edema, nonfilling of affected nerve root sleeve) and (5) anatomic variations of the cul-de-sac.

Position of the Protrusion.—Except in unusual cases the protruded fragment is situated in the anterior portion of the spinal canal and will produce its greatest effect on the column of iodized oil when the patient is lying in a prone or prone-oblique position. The classic defect is a

sharply defined unilateral rounded indentation of the iodized oil shadow opposite an intervertebral disk (Fig. 1). It occurs in about 65 per cent of cases. Midline protrusions when of moderate size may produce only a central defect.

iodized oil posteriorly and laterally. In the lateral view, its presence is characterized by a broad or rounded indentation on the posterior aspect of the shadow of the iodized oil between contiguous laminae. In the prone or supine positions the hy-

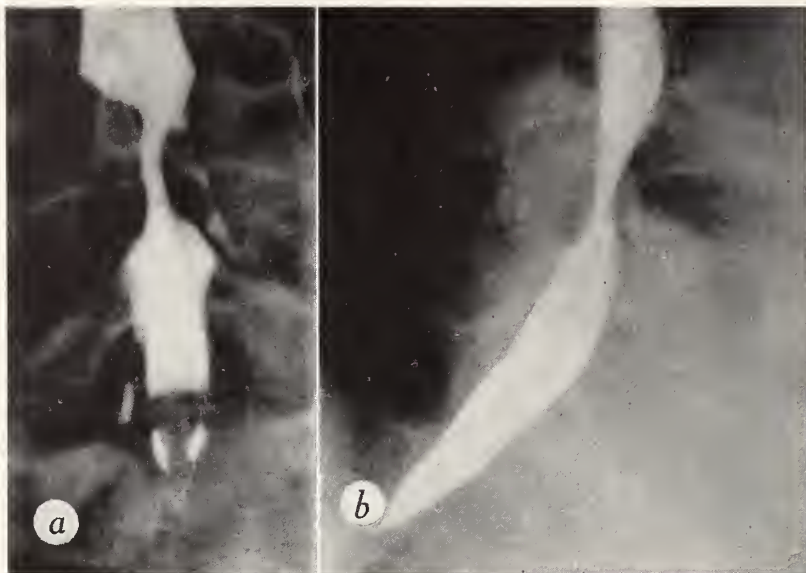


Fig. 4. Intraspinous protrusion of the intervertebral disk between the fourth and fifth lumbar vertebrae and associated hypertrophy of the ligamentum flavum; *a*, anteroposterior view revealing broad bilateral deformity of iodized oil shadow; *b*, lateral view revealing anterior indentation of the shadow due to the protruded disk. The broad indentation on the posterior aspect of the shadow at the same level is due to hypertrophy of the ligamentum flavum.

Size of the Protrusion.—Except as the iodized oil deformity may be influenced by the presence of hypertrophy of the ligamentum flavum, the larger the protrusion the greater the obstruction of the subarachnoid space will be. Partial obstruction occurs in about 11 per cent of cases and complete obstruction in only about 2.5 per cent of cases (Fig. 2). The larger the protrusion the greater the tendency to produce a bilateral deformity, which occurs in about 35 per cent of cases (Fig. 3).

Hypertrophy of the Ligamentum Flavum.—This condition is found frequently in association with a protruded intervertebral disk. It usually occurs at the same level as the protrusion but may occasionally be found at other interspaces. Localized hypertrophy of the ligamentum flavum without coincidental protrusion of a disk is not common. When it does occur it may imitate all the clinical phenomena of a protruded intervertebral disk. Because of the anatomic location of the ligamentum flavum, this structure when it is hypertrophied will compress the column of

protrusion is portrayed by a broad indentation of the column of iodized oil, generally bilaterally but occasionally unilaterally. When considerable hypertrophy of the ligamentum flavum accompanies a large protruded disk, the mass of iodized oil is compressed between the protruded disk anteriorly and the hypertrophied ligamentum flavum posteriorly and laterally. The resultant deformity is characteristic (Fig. 4*a* and *b*).

Changes in the Shadow of Nerve Roots.—In about a third of the cases of protruded intervertebral disk, displacement of shadows of nerve roots will be visible at the site of the protrusion. Abnormal enlargement of a nerve root shadow indicating edema is frequently observed in roentgenograms at or just above the site of a protruded disk (Fig. 2). An early change that results from edema of a nerve root is obliteration of the usual shadow of the nerve sleeve where the root passes through the dura.

Anatomic Variations of the Cul-de-sac.—Two anomalies of the terminal portion of the cul-de-

sac which occur in about 5 per cent of cases may complicate the roentgenologic diagnosis of a protruded lumbosacral intervertebral disk. The first is an anomaly in which the terminal portion of the cul-de-sac is narrower than usual below the level of the fourth lumbar intervertebral space. In such a case a moderate protrusion of the lumbosacral disk may not deform the narrow subarachnoid space and a large protrusion may produce only a minimal defect. The second anomaly is one in which the cul-de-sac terminates one or two segments more cephalad than usual with or without a variation in its diameter. In a few instances, the cul-de-sac will terminate above the level of the lumbosacral interspace. When either condition is present, especially the latter, it is obvious that a lumbosacral protrusion may not be disclosed by means of iodized oil or any other contrast agent.

Air Myelography

The use of air or oxygen for the study of the spinal subarachnoid space has been revived in recent years and this procedure has certain advantages: (1) there are no contraindications, (2) the air is resorbed following examination, (3) there is no irritating effect other than that which temporarily results from the injection and (4) roentgenoscopy is not necessary.

On the other hand, there are certain definite disadvantages: (1) the procedure is unsatisfactory for nonobstructing lesions above the conus, (2) the shadows and defects are less distinct than those caused by iodized oil, their interpretation is more difficult and the likelihood of error is increased, (3) roentgenoscopic verification of the defect is not possible, (4) inconclusive examinations are much more frequent than with iodized oil and (5) experience has shown that the results of air studies, especially when negative, are less accurate than the results obtained with iodized oil.

Experience indicates that if the suspected level of a lesion is at or above the conus, the use of air or oxygen will not help in diagnosis unless obstruction of the subarachnoid space has occurred. This results from the fact that air or oxygen is very difficult to hold in a desired position in the thoracic or cervical portion of the spinal canal and its use in these regions is further complicated by the superimposition of the shadow of air in the trachea, larynx and pharynx which

renders the interpretation of resulting shadows difficult or impossible. Iodized oil therefore is the medium of choice for the demonstration of lesions at or above the conus.

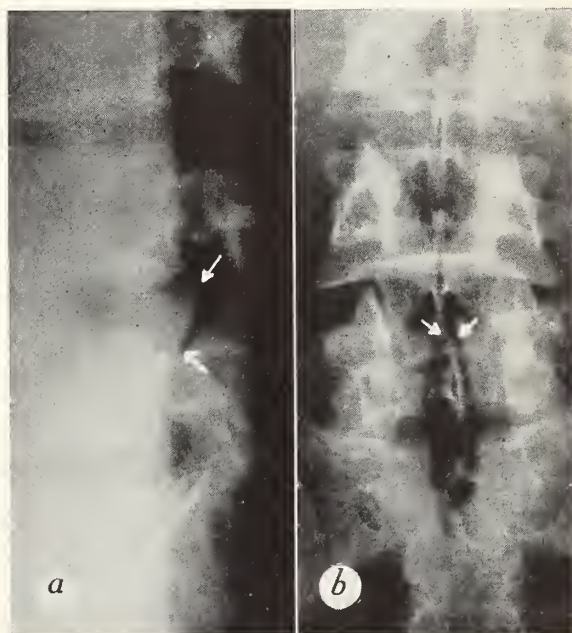


Fig. 5. Intraspinous protrusion of the intervertebral disk between the fourth and fifth lumbar vertebrae. Spinogram (air study): *a*, lateral view showing indentation of anterior aspect of the air shadow by the protruded disk at the site of protrusion; *b*, bilateral narrowing of the air shadow opposite intervertebral space between the fourth and fifth lumbar vertebrae.

Statistics³ indicate that the great majority of protruded intervertebral disks occur in the lumbar and lumbosacral regions where they are accessible to examination by means of either air or iodized oil. Since there is a reasonable chance that the protrusions may be disclosed by means of air or oxygen, it is probably good judgment to attempt their localization by this method before iodized oil is resorted to (Fig. 5). If the results of air studies are positive much has been gained because in 83 per cent of such cases a pathologic lesion has been found by the surgeon at the site of the deformity. If the results of air studies are inconclusive or unsatisfactory, then iodized oil may be used. If the air studies result in negative findings and the history and neurologic examination indicate the probable presence of a protruded disk, the surgeon must then decide whether to check the findings in the spinogram by means of iodized oil or whether to advise laminectomy on the basis of the history and neurologic findings. In my experience, a negative spinogram (air study) has proved com-

paratively unreliable because in a high percentage (77 per cent) of such cases a pathologic lesion has been found at operation. This fact should not be lost sight of by the clinician in appraising the results of such studies with air. When the use of air reveals either a deformity that will not account for the patient's symptoms or a lesion, the level of which is not compatible with the symptoms, the results should be confirmed with iodized oil before laminectomy is advised. Further experience in the interpretation of spinograms (air studies) will undoubtedly re-

sult in improvement of the diagnostic accuracy of the procedure. However, because of certain basic limitations of the method it is not likely that its efficiency will ever equal that attained by iodized oil myelography.

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TREATMENT OF PROTRUDED INTERVERTEBRAL DISKS*

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IT is a distinct pleasure for me to have the privilege of reporting to our State Society again within two years on a subject which has not decreased but has tremendously increased in interest not only in this state but throughout the United States and in many foreign lands.

When I spoke, in Duluth, at the State Meeting two years ago I made the following statement³: "There is only one treatment for protrusion of an intervertebral disk that is producing compression of the spinal cord or of a nerve root. When a definite protrusion is demonstrated and a lesion at the level of the protrusion will explain the patient's symptoms and signs, laminectomy for the express purpose of removing the protruded portion of the disk should be performed."³ Today that statement is just as true as it was then and it needs only to be emphasized. The second sentence, which reads as follows, "When a definite protrusion is demonstrated and a lesion at the level of the protrusion will explain the patient's symptoms and signs, laminectomy for the express purpose of removing the protruded portion of the disk should be performed," should, in the light of our increased knowledge of the lesion and our increased technical ability, be changed to, "When a definite protrusion is demonstrated and a lesion at the level of the protrusion will explain the patient's symptoms and signs, it

should be removed." This change is necessitated by the fact that since December, 1938, it has been possible in a large percentage of cases to remove protruded intervertebral disks without removing any bone from the spinal column.

In order to perform such operations it is essential that the operator know which disk is protruded, have special instruments and a large experience dealing with small intraspinal lesions. It is therefore essential in the great majority of cases to have the lesion visualized by a contrast medium. The use of a contrast medium serves not only to demonstrate the protrusion but also to exclude or demonstrate other lesions. Since not infrequently protrusions are multiple it is necessary to know the condition of the other disks. At times also the history and findings on examination seem to indicate definitely that the difficulty experienced by the patient is the result of a disk protrusion, whereas in reality the true pathology is an intraspinal neoplasm. This may be recognized at the time of diagnostic lumbar puncture, at the time of visualization of the spinal canal or only when the lesion is uncovered at operation. When operating, therefore, for a protruded intervertebral disk, the surgeon should be prepared to handle any intraspinal lesion that might be encountered. The electrosurgical unit, suction apparatus and other special apparatus that is standard equipment in a modern neurosurgical amphitheater should be at hand and

*From the Section on Neurosurgery, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 22, 1940.

ready for use. Well-trained assistants and surgical nursing staff are essential.

All patients who come to The Mayo Clinic complaining of pain low in the back or sciatic pain or both are not operated on for protruded intervertebral disk. In fact, all patients with such a complaint are not fully investigated for such a lesion. Only those patients who have definite evidence of pressure on the spinal cord or on a nerve root and those who are unable to carry on their normal activities are thoroughly investigated (that is, by studies of the spinal fluid with or without visualization of the spinal subarachnoid space). These patients who have had distress for a short time and who show no impairment of nerve function and those who are able to keep up with their usual work with the aid of some physical therapy plus the wearing of a support are not urged to undergo extensive investigation with the idea of undergoing operation. We see many patients whose history and physical examination suggest the probability of protrusion of a disk and we advise conservative therapy for them. They are told what we suspect as the underlying pathologic lesion and are told that if the symptoms increase in severity or become incapacitating, then they should submit to a thorough investigation and possibly to operation.

In order to accomplish most for the large group of patients who have backache and sciatic pain, team work and coöperation on the part of the patient, the family physician and those in special fields is essential. The general condition of the patient must be evaluated not alone from the standpoint of physical health but also from the economic point of view. His home life should be considered, the type of work to which he is accustomed and whether or not there is an insurance or compensation angle.

When it is agreed that the patient is incapacitated as far as his usual activities are concerned and that relief must be offered, the close coöperation of the clinician, orthopedist, neurologist, roentgenologist and neurosurgeon will result in the best possible care. Today it is impossible for any one doctor to know all branches of medicine well and only through close coöperation can we expect to obtain the best results from our therapeutic endeavors.

When an operation for protruded intervertebral disk is to be undertaken, all pertinent factors relative to the diagnosis, the patient's general

physical condition, the presence of complications, orthopedic or otherwise and the surgeon's experience plus the question of insurance or compensation liability should be thoroughly considered. There are many things other than the presence of a protruded portion of fibrocartilage within the spinal canal which influence the result of therapy.

The mere presence of a history of backache and sciatic pain or of both, even with positive roentgenologic evidence, is not sufficient indication for a surgical attack on the lesion if these are any other factors of greater weight which contraindicate a major surgical procedure. The operative removal of a protruded disk is a major surgical procedure and it should not be attempted by anyone not familiar with intraspinal surgery. Although the history, findings and roentgenograms may indicate the protrusion of a disk, at operation a primary tumor of the spinal cord or of the nerve roots may be encountered. This is true even in spite of the onset of symptoms after a specific injury. I recall a young girl who related what we could call a typical history of protrusion of a lumbar disk and the findings on physical examination likewise were typical. At operation, however, she was found to have an ependymoma of the filum terminale. An extensive intradural operation that required the use of the electrosurgical unit and all of the special neurosurgical equipment had to be performed. Before undertaking an operation for a protruded disk, it is extremely important to know whether or not there is an insurance or compensation angle. This is important not alone for studies of final results but also for carrying out the pre-operative examinations, evaluating symptoms and following the patient's postoperative period of hospital convalescence. Patients who think that compensation may be had for the most part make poor witnesses for themselves in the examining room. Their symptoms are likely to be bizarre, more numerous and much more marked than those of an individual who is interested only in getting relief from his distress. Patients who have compensation in view seem to feel that they must impress the examiner with their terrific plight. One must be very careful in examining such patients lest he be misled into placing too much emphasis on inconsequential symptoms and signs, or lest he overlook pathognomonic signs hidden by functional states.

In order to check up on our diagnostic ability and to evaluate the progress of the neurosurgical attack on intractable backache and sciatica, I asked Dr. Patton, neurosurgical first assistant, The Mayo Foundation, to analyze the last 100 records of cases previous to January 1, 1940, in which operation was performed because of a diagnosis of protruded intervertebral disk. Out of this study came some very interesting facts. These cases represent 100 consecutive spinal operations performed by Adson, Craig, Baker and me. Of the 100 patients, ninety-one were found to have a protrusion of a single disk, whereas each of three patients had two protruded disks. The remaining six patients were found to have thickening and fibrosis² (so-called hypertrophy) of one or more ligamenta flava without protrusion of a disk. Four of these six cases had two abnormal ligamenta flava whereas the other two had only one thickened ligament.

In the period covered by these 100 cases, radiopaque oil* was injected in eight cases to confirm our clinical diagnosis and to locate more accurately the level of the lesion. In seven of the eight cases, the roentgenologic findings were positive for protruded disk; in the eighth case the findings were reported by the roentgenologist as negative. In view of this patient's history and clinical findings, the neurologist, neurosurgeon, and orthopedist all felt that radical treatment was indicated. He had had all the conservative measures without relief. His story was suggestive of a protruded disk. The patient's fourth and fifth lumbar disks were explored by the neurosurgeon without detecting any abnormality. There was definite thickening and fibrosis of the ligamentum flavum which was resected. The orthopedist who was present transplanted a graft from the flat internal surface of the patient's tibia to the lumbosacral region for the purpose of fusing the last two lumbar vertebrae and the first two sacral vertebrae. This procedure had been explained to the patient prior to his decision to have an operation.

At times, because of the coexistence of an orthopedic condition, a bone graft is applied by the orthopedic surgeon after the neurosurgeon has removed a typical protruded disk.

It is the opinion of orthopedists and neurosurgeons at the clinic that bone grafting or fusion is necessary in only a small percentage of cases in which a protruded disk is found and is removed.

Results of Operative Treatment of Protruded Intervertebral Disks

When a patient is operated on and a classical protrusion of a lumbar disk is removed because of its production of pain low in the back or sciatic pain or both, that patient should obtain immediate relief of his symptoms. In a small percentage of such cases, several days will elapse before complete relief ensues. In a very small percentage of cases the patient will experience immediate relief but will have some distress when up and around for as long as two or three months after operation. The patient whose convalescence is not complicated by other organic lesions or medico-legal problems is usually back at his occupation three months after dismissal. In any compensation case or insurance case, at least twice as long a period of convalescence is likely to be required. Such individuals must be convinced that they are relieved and are able to carry on normally. If compensation is pending and there is a dispute regarding liability, and particularly if there is going to be a trial in open court, the patient is prone to have a neurosis develop and to present many symptoms which cannot be explained on an organic basis. The most careful examination may fail to reveal any signs indicative of organic disease and those signs which were present prior to operation may be gone but the patient will insist that he is incapacitated and unable to do any work. If the question of insurance and compensation could be settled prior to operation, I feel sure this group of patients would obtain a much more satisfactory final result.

That the surgical removal of protruded intervertebral disks is based on sound anatomic, pathologic and surgical grounds is clear to all who have had much experience with the lesion. That all patients are not relieved of their complaints following operation likewise is apparent and is again admitted.

When we stop to consider, however, that this group of patients is suffering from intractable pain which has been present on the average for several years and which has not responded to any type of conservative treatment or to many

*Although radiopaque oil is by far the best contrast medium for the visualization of the spinal canal we have tried to avoid its use whenever possible because of its slow absorbability. This is particularly true in the handling of medico-legal cases. It is so easy for the patient who has an opaque substance in the spinal canal to try to capitalize on its presence. We are now using air almost entirely for visualization of the lumbar region of the spinal canal.¹

types of radical operations, such as manipulation under anesthesia, open operation and stretching of the sciatic nerve, fasciotomy and bone grafting, we can still speak optimistically about the results of surgical removal of the protruded portion of intervertebral disks even though this operation does not relieve all patients.

At the present time we are undertaking a follow-up study of all patients operated on at The Mayo Clinic for protruded intervertebral disk. This study will require a great deal of time and effort and when it is completed the results will be published. At present, although we cannot yet give accurate statistics on our cases, there are certain observations which have been made which seem worthy of record.

The mortality rate associated with operations for protruded intervertebral disks in our hands has been about 0.5 per cent. About 3 to 5 per cent of the patients who come to operation for a protruded disk require bone grafting or fusion because of a coexisting orthopedic condition. The fusions are performed at the time of the intraspinal operation by one of our orthopedic colleagues who, of course, has seen and examined the patient prior to operation. About 1 per cent of the patients will return, usually after unusual stress or strain to the back, for the removal of another protruded disk. About 1 or 2 per cent of the patients who have been operated on for a protruded disk will require fusion subsequently because of a static type of backache or because of failure to obtain complete relief following the removal of the protruded disk.

In spite of the most careful selection of patients for operation and the most painstaking care in the performance of these operations, there will be a group of patients who are not completely relieved. Some of these will fail to obtain relief because of the coexistence of other diseases which may produce or contribute to the production of the same symptoms, such as spondylitis, endarteritis obliterans, diabetes and old vertebral fractures (rare with protruded disks). Patients with a low threshold to pain may continue to complain of distress in the back and may focus their minds on the site of operation. There are others, who, often for reasons best known to themselves and at times when discovered by the physician adequate enough, have an overpowering desire for sympathy and continue to enjoy "poor" health. In some cases, it is obvious

at the time of operation that the compressed cord or nerve root has sustained irreparable damage and even though the pressure is removed the patient is likely to have residual symptoms or signs. In other cases, the nature of the lesion must be that of an interstitial neuritis (from pressure) with marked fibrosis. At times it can be seen that some of the fibers of the compressed nerve root have been interrupted by the protruded disk.

By far the most troublesome group and the hardest to appraise satisfactorily consists of those cases in which there is litigation pending. This group demands the utmost consideration not alone because of the difficulties involved but also because of the great tendency for people to sue one another and particularly to sue corporations in an attempt to obtain compensation for their misfortunes regardless of whether or not the suit is justified. In this connection careful attention should be paid to the taking of the history in these cases and dates of alleged injuries should be recorded. The question of compensation and insurance problems should be noted, if it is possible to get the information, while the history is recorded. Any physician who has seen many industrial, automobile or railroad accident cases knows how difficult it is to obtain an excellent result in such cases. Likewise, if a patient is carrying disability insurance that will pay him more than his declining income, it is easy to see that it might be difficult to cure him by means of any type of therapy. The insurance companies, of course, realize this, and the larger companies are very careful about writing policies with clauses which would entitle the insured to collect as much as or more than his income in case of disability.

We, as physicians, must continue, of course, to do everything that we can to alleviate suffering and we must strive to restore all injured persons to their former activities, but at times there are factors over which we have little or no control and these factors militate against the success we so sincerely desire from our therapeutic efforts.

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INTRACRANIAL TUMORS*

A Study of 467 Histologically Verified Cases

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SINCE the appearance of the various studies on the classification of the glioma group of brain tumors (Roussy, L hermitte and Cornil,²⁸ Roussy and Oberling,²⁹ Bailey and Cushing,⁹ and Bailey^{4,5}) a great impetus has been provided for the investigation of all intracranial tumors. Many investigators have reviewed those brain tumors that have been available in their laboratories, in an attempt to reclassify these neoplasms in the light of these more recent advances. An attempt has also been made by some to correlate the various individual histological types with the age of the patient, the location within the brain or intracranial cavity, the rapidity of growth and finally the amenability to surgery or the response of the tumor to deep x-ray therapy. Such reports have been published by Davidoff and Ferraro,¹⁶ Cushing,¹⁴ Bailey,⁴ and Gogel.²⁰

In keeping with these advances in our knowledge regarding the intracranial neoplasms, an attempt was made to collect, study and reclassify all such tumors that were available from the Department of Pathology and the Division of Nervous and Mental Diseases of the University of Minnesota. Only those cases were selected in which sufficient material or sections were available to allow for a careful histological study. Much of the older material was unsatisfactory while in many cases no material had been preserved. After due selection there remained a total of 467 tumors that were used in the present investigation. For our statistical studies we also included twelve pituitary adenomas which had been unmistakably diagnosed by x-ray, thus bringing the total tumors to 479. Because of the infrequency of operation upon pituitary adenomas and also because of their prolonged course, they are infrequently obtained for histological study. It is for this reason that these 12 clinically diagnosed cases were included, in order to make this present series as representative as possible. In all cases fairly complete records were available. This material appeared to us to offer a fairly accurate picture of the frequency of the

various types of tumors, inasmuch as the cases were obtained without selection throughout the state. Since the greatest portion of the material was obtained at autopsy, (406 out of 479 cases or 85 per cent), a study of the whole tumor was usually possible as well as a careful investigation of the varying histology in different portions of the tumor.

The intracranial tumors in this study were divided into the following nine groups described and used by Bailey: tumors of the nerves, tumors of the meninges, gliomas, vascular tumors, tumors of mixed tissue, hypophyseal tumors, granulomas, miscellaneous group, and metastatic tumors. The relative frequency of each is listed in Table I.

A comparison of our figures with those of other investigators is shown in Table II. All figures have been corrected to coincide with the classification presented in this study.

A brief statement concerning our experience with these groups of intracranial tumors can now appropriately be undertaken.

Tumors of Nerves

This group of intracranial neoplasms includes the acoustic neuromas, the optic nerve gliomas, and the cerebral type of neurofibromatosis. It comprised but 1.5 per cent of our cases. This is in direct contrast to the series of Bailey⁴ and Cushing,¹⁴ where 176, or 9.1 per cent, of their tumors were acoustic neuromas alone. The latter tumor, which was by far the most common one in this group, arises from the nerve sheath, although there is still some question as to whether they are Schwannian or connective tissue in origin. Most investigators feel that they probably arise from the endo-perineurium and are collagenous in origin. The nerve fibers usually passed around this tumor and were never found within it.

A von Recklinghausen's disease in which the predominant involvement is intracranial is of rather unusual occurrence; only one such case appeared in the present series.

Optic nerve gliomas are also extremely uncommon. Verhoeff,³⁰ at the Massachusetts Eye and

*From Division of Nervous and Mental Diseases, University of Minnesota. Assistance in the accumulation of these data was furnished by the personnel of Work Projects Administration. Official number 665-71-3-69.

INTRACRANIAL TUMORS—BAKER

TABLE I. FREQUENCY OF DIFFERENT GROUPS OF INTRACRANIAL TUMORS

Type	Operation	Autopsy	Total	Per Cent
I. Tumor of Nerves	2	5	7	1.5%
II. Tumors of Meninges	12	76	88	18.4%
III. Gliomas	38	242	280	58.5%
IV. Vascular Tumors	4	21	25	5.2%
V. Tumors of Mixed Tissue	2	2	4	0.8%
VI. Hypophyseal Tumors	14*	20	34	7.1%
VII. Granuloma	0	30	30	6.3%
VIII. Miscellaneous	1	10	11	2.3%

*Twelve of these were diagnosed by x-ray and not studied histologically.

TABLE II. COMPARATIVE FREQUENCY OF TUMOR GROUPS

	Bailey & Cushing	Davidoff & Ferraro	Gogel	U. of Minn. Series
I. Tumor of Nerves	176—9.1%	2—2.7%	7—1.6%	7—1.5%
II. Tumors of Meninges	271—14.0%	23—31.5%	83—18.7%	88—18.4%
III. Gliomas	874—45.1%	36—49.3%	239—54.0%	280—58.5%
IV. Vascular Tumors	41—2.1%	0	17—3.8%	25—5.2%
V. Tumor of Mixed Tissue	21—1.1%	3—4.1%	10—2.3%	4—0.8%
VI. Hypophyseal Tumors	452—23.3%	7—9.6%	39—8.8%	34—7.1%
VII. Granuloma	45—2.3%	2—2.7%	6—1.4%	30—6.3%
VIII. Miscellaneous	58—3.0%	0	42—9.5%	11—2.3%
Total	1938	73	443	479

Ear Infirmary, encountered four out of a total 669,857 patients, while Martin and Cushing²⁵ recorded seven chiasmal tumors out of a total 826 intracranial neoplasms. These tumors are usually gliomas, our case being a fairly typical slow growing astrocytoma. The patient, five years after a partial removal, is still living and well. It appears that these new growths either take origin and remain confined to the intraorbital portion of the nerve or that their growth is slow enough to allow for a long span of life in spite of non-complete removal.

Tumors of Meninges—Meningiomas

These are, as a rule, benign encapsulated masses that rarely invade the brain but compress it and may, because of their slow growth, reach huge dimensions. As is well known they frequently invade the skull, producing increased vascularization, hyperostosis or even direct erosion. The current name for these tumors has been adopted as meningiomas, although Mallory²⁴ and Penfield²⁷ have felt that on histological grounds the cells of the leptomeninges belong to the fibroblastic series and that these neoplasms should be called arachnoidal fibroblastomas. It is recognized today that they are derived from some embryonal rests in the meninges, but beyond this there is little agreement. Since the probable origin of these tumors is still a moot question, it

seems best to adopt the non-committal term of meningioma until further information is acquired concerning their origin.

In the present study there was a total of eighty-eight meningiomas, which comprised 18.4 per cent of all intracranial tumors. This compares fairly closely to most other series (Bailey and Cushing, 14 per cent; Gogel, 18.7 per cent). Sixty-five per cent of these tumors occurred between the fifth to the seventh decade, while 6 per cent occurred within the first decade. As could be expected from such a slow growing tumor, over one-third of the cases gave histories dating back over a period of at least three years.

The location of the meningiomas was of great interest. The greatest number arose from the region of the sagittal sinus, fourteen being situated anteriorly and four posteriorly. The next most common location was the sphenoid ridge, where ten of the tumors were situated. Next, in order of frequency, these tumors occurred in the cerebellopontine angle, eight; tuberculum sellae, 7; cribriform plate, seven; dura over temporo-parietal region, six; foramen magnum, five; clivus, three; torcula, three; dura over temporal region, two; corpus callosum, pineal and dura over the parietal and occipital regions, one each.

Histologically they presented a great variability in tissue structure. For this reason they were reclassified according to the most prominent

type of tissue present (Table III). This type of classification was used by Bailey and Bucy⁸ in their publication on meningiomas.

TABLE III. HISTOLOGIC TYPES OF MENINGIOMAS
(18.5 per cent of all intracranial tumors)

Tumors of Meninges	Number	Per Cent
1. Fibroblastic	36	40.9
2. Psammomatous	19	21.6
3. Meningotheliomatous	12	13.6
4. Mesenchymal	3	3.4
5. Angioblastic	3	3.4
6. Melanoblastic	3	3.4
7. Lipomatous	3	3.4
8. Osteoblastic	2	2.3
9. Sarcomatous	1	1.1
10. Undetermined	6	6.8
Total	88	100.0

It is seen from this division that the most common type of meningioma was composed of fibroblasts with the tumor cells forming fibroglia and laying down collagen. It was to this group of meningiomas that Mallory's term of arachnoidal fibroblastomas was applied. Although some fibroglia and collagen fibers were found in many of the other histological types, still the predominant tissue was of another nature and hence warranted a different classification. The next most frequent and probably better known types of meningiomas were the meningotheliomatous and psammomatous varieties, which comprised almost 35 per cent of the meningiomas. The meningotheliomatous variety consists of sheets of cells in which the cell boundaries are hard to distinguish. When the cells tend to assume whorl formation within the center of which are frequently found concretions, the cell type is spoken of as psammoma. In many respects these two varieties are very similar histologically. The rest of the histological varieties of meningiomas were fairly uncommon.

It was apparent from a comparison of the case histories and the histological types, that the fibrous, psammomatous and meningotheliomatous varieties were relatively slow growing tumors. The most rapidly growing meningiomas were the mesenchymal and sarcomatous varieties with an average duration of symptoms of only 2 and 3.5 months, respectively. The slowest growing type was the osteoblastic with an average history of twelve and nineteen years in each of our cases.

Gliomas

This group has received a great deal of attention during the past number of years due to the most enlightening contributions of Bailey on their histological structure and classification. Bailey's classification of the gliomas was first published in 1926. In spite of the numerous alterations and additions (Penfield,²⁶ Bergstrand,¹¹ Carmichael¹²) the classification as presented by Bailey has appeared to be the most practical and has been adopted for use in our laboratory. The percentages of each type of glioma in our studies as compared with other investigators are presented in Table IV.

It will be seen that the relative frequency of the various gliomas in most studies is fairly consistent with the exception of the astrocytomas which were somewhat more numerous in our series. This difference may easily be accounted for in the individual variation in the histological interpretations of cell type. It is very likely that some of the tumors which we were inclined to classify as rapidly growing astrocytomas have been considered by other investigators as glioblastomas.

The usual location of our gliomas have been tabulated in Table V. The greatest number occurred in the frontal, temporal, and parietal regions. The medulloblastomas were almost exclusively cerebellar tumors, while the ependymomas seemed to have the widest distribution and appeared in almost any region of the brain. Many of the tumors were so extensive as to involve more than one region and hence were included under more than one location.

The relative age distribution and age incidence of these tumors are summarized in Tables VI and VII. The age incidence was determined by calculating the frequency of the total number of gliomas in each decade compared to the total number of autopsies performed. We were forced to omit the first decade since the many stillbirths included in this age group prevented an accurate determination.

When gliomas of all types were considered they appeared with almost equal frequency during the first six decades of life. The cerebellar tumors (astrocytoma and medulloblastoma) and the ependymomas tended to occur most frequently during the earlier decades, although cerebral astrocytomas and glioblastomas were by no means uncommon during this period. If the former group of tumors were excluded, then the

INTRACRANIAL TUMORS—BAKER

TABLE IV. COMPARATIVE FREQUENCY OF THE GLIOMAS

	Bailey ⁸	Davidoff & Ferraro ¹⁶	Gogel ²⁰	Elvidge, Penfield & Cone ¹⁷	U. of Minn. Series
Total Tumors	874	36	239	211	280
Astrocytoma	255-29.2%	6-16.7%	58-24.3%	55-26.1%	127-45.4%
Astroblastoma	35- 4.0%		4- 1.7%	13- 6.2%	14- 5.0%
Spongioblastoma Polare	32- 3.7%	1- 2.8%	16- 6.7%	11- 5.2%	8- 2.9%
Glioblastoma Multiforme	218-23.8%	24-66.7%	84-35.1%	52-24.6%	71-25.4%
Medulloblastoma	86- 9.8%		23- 9.6%	28-13.3%	21- 7.5%
Oligodendroglioma	27- 3.1%	1- 2.8%	3- 1.3%	8- 3.8%	6- 2.1%
Pinealoma	14- 1.6%	1- 2.8%	11- 4.6%	2- 0.9%	6- 2.1%
Ependymoma	25- 2.9%	3- 8.3%	23- 9.6%	19- 9.0%	20- 7.1%
Neuroepithelioma	2- 0.2%		2- 0.8%	3- 1.4%	4- 1.4%
Papilloma of Choroid Plexus	12- 1.4%		6- 2.5%		1- 0.4%
Ganglioneuroma	3- 0.3%		9- 3.8%		
Undetermined	175-20.0%			20- 9.5%	2- 0.7%

TABLE V. LOCATIONS OF GLIOMAS

	Astrocytoma	Astroblastoma	Spongioblastoma Polare	Glioblastoma Multiforme	Medulloblastoma	Oligodendroglioma	Ependymoma
No. of Cases	127	14	8	71	21	6	20
Female	52	2	3	30	9	3	8
Male	75	12	5	41	12	3	12
<i>Location:</i>							
Frontal	40	4	1	23	1	3	5
Temporal	24	3	1	17	1		2
Occipital	14	4	1	13		2	3
Parietal	26	5	1	23	2	1	2
Basal Ganglia	14	1		9			1
Cerebellum	11		2		12		4
Midline Cerebellar	2			1	4		2
Third Ventricle	8		1	3			1
Lateral Ventricle	8		2	5			1
Midbrain	4	1	1	1			1
Optic Nerve	2						
Pons & Medulla	6		1	3			4

TABLE VI. AGE INCIDENCE OF GLIOMAS

Decade	2nd	3rd	4th	5th	6th	7th	8th & over
Autopsies	1182	2418	3223	4306	4655	4503	3737
Total tumors	29	29	41	63	40	18	4
Frequency	2.4%	1.2%	1.3%	1.4%	0.9%	0.4%	0.1%

TABLE VII. AGE DISTRIBUTION OF GLIOMAS

Decade	1st	2nd	3rd	4th	5th	6th	7th	8th or over
Cerebral Astrocytomas	9	6	14	17	30	22	9	3
Cerebellar Astrocytomas	5	4	1	2	0	1	0	0
Astroblastomas	1	2	0	3	4	4	0	0
Spongioblastoma Polare	3	0	0	1	3	1	0	0
Glioblastoma Multiforme	4	4	8	13	23	10	9	0
Medulloblastoma	8	6	3	2	1	0	0	1
Ependymoma	9	4	1	2	2	2	0	0
Pinealoma	0	3	2	1	0	0	0	0
Total	39	29	29	41	63	40	18	4

gliomas appeared most commonly during the fourth to the sixth decades.

With these general remarks, it would seem appropriate to briefly summarize some of the characteristics of the individual gliomas. De-

tailed histological descriptions will be avoided, since such excellent reports on this subject have already been published (Bailey,^{1,3,2} Bailey and Bucy,^{7,6} Kwan and Alpers,²² Globus and Silber¹⁹).

The astrocytoma was the most common type of intracranial neoplasm comprising almost half of the gliomas and one-fourth the total intracranial tumors. It was a slow growing infiltrating tumor with a tendency to degenerate with cyst formation. The longest duration of symptoms in our series was twenty-two years, while twenty-three of the cases gave a history of three years or longer. In adults it was most commonly situated in the frontal, temporal and parietal lobes, and appeared usually during the fifth and sixth decades. In children it occurred with about equal frequency within the cerebellum and cerebral hemispheres. About 30 per cent of these tumors were cystic or associated with a cyst.

The glioblastoma multiforme was usually a rapidly infiltrating tumor arising within the white substance of the cerebral hemispheres. It presented an extreme multiformity in the size and shape of its cells and a great variation of appearance due to associated hemorrhages and necroses. It comprised about one-fourth of the gliomas and involved primarily the frontal and parietal regions of the brain. It occurred most frequently between the fourth to the sixth decades of life. The longest duration of symptoms was twelve years, while only six gave a history extending over three years. In most cases the tumor was rapidly growing and offered a life expectancy of less than one year after the onset of symptoms.

The medulloblastoma was primarily a cerebellar tumor of children. It comprised about 7.5 per cent of the gliomas. Fourteen of our twenty-one cases occurred during the first two decades of life, only one occurring as late as the fifth decade. This tumor was very rapidly growing and involved primarily the midline of the cerebellum, in which cases the life expectancy after the appearance of symptoms was less than eight months. Only 3 per cent of these tumors were cystic, the rest being fairly solid but somewhat soft and reddish.

The spongioblastoma polare was a relatively uncommon tumor. It is reported to be most common in the region of the brain stem, although in our series it occurred in widely scattered regions of the brain (Table V). This tumor occurred with equal frequency during the first and fifth decades. When occurring in the region of the base of the brain or within the posterior fossa it was usually a slow growing, fairly solid mass, one of our cases giving a definite history of involve-

ment for over twenty-three years. Those tumors appearing within the cerebral hemispheres were somewhat more active and offered a shorter life expectancy. Because of the general growth characteristics of this tumor one often wonders whether it is really composed of bipolar spongioblasts, or whether it could perhaps be an astrocytoma, which, because of some peculiarity of growth, has developed a bipolar appearance to its cells.

The ependymoma comprised 7.1 per cent of the gliomas. It appeared predominately in the younger age groups, thirteen of the twenty cases occurring during the first two decades of life. Most of the tumors were situated in the vicinity of the walls of the lateral ventricles chiefly in the region of the frontal and occipital horns. Only six occurred in the region of the fourth ventricle. In Bailey's original series, by far the greatest number were found in the posterior fossa in the vicinity of the fourth ventricle. Finckler and Coon¹⁸ reported eight cases, of which five occurred in the region of the lateral ventricles. Because of their location near the ventricular system, with early production of a block in the fluid flow, the duration of symptoms was usually short. Only one case presented a history extending over five years; the remaining all lived less than eight months after the onset of symptoms. Since these tumors pathologically are usually slow growing encapsulated masses one would suspect from the rather acute clinical course that they lay dormant for a long time without producing symptoms. Because of their inaccessibility to surgery, removal is usually difficult.

The oligodendrogliomas were all slow growing tumors of the cerebral hemisphere of adults. Our cases were too few to warrant any general conclusions. A few were calcified and hence allowed for x-ray diagnosis.

The remaining glioma types occurred too infrequently in our series to warrant any general comment.

Vascular Tumors

In these studies the classification of Cushing and Bailey¹⁵ was again followed fairly closely. These authors classified the vascular tumors of the nervous system into angiomas and angioblastomas.

The angiomas are usually considered as developmental anomalies capable of subsequent alteration in size and character. These are frequently

subdivided into venous and arteriovenous types. Because of the abnormal development and structure of the vessel walls, it is often difficult even histologically to tell whether one is dealing with arteries or veins. Since these tumors are malformations, they usually are very slow in their clinical course and appearance. One would, therefore, expect symptoms to be present over a long period of time. This was true in our cases. Of the thirteen angiomas, even though accurate histories were not obtained in all, eight presented symptoms for more than two years and three of these had symptoms for over ten years. The angiomas comprised 2.7 per cent of all the intracranial tumors. They occurred chiefly between the fourth to the seventh decades and all but three cases were found in the cerebral hemispheres. A more detailed study of these tumors will form the material for a later publication.

The angioblastomas are considered as true neoplastic growths. They were usually associated with large cysts, the tumor itself being small, reddish and solid and embedded in the cyst wall. These tumors were most frequently situated in the cerebellum (seven of our twelve cases) and produced clinical symptoms of a rapidly increasing intracranial pressure associated with some cerebellar involvement. The duration of symptoms before death or operation was surprisingly short. Lindau²³ in 1926 discussed the association of these cerebellar tumors with angiomas of the retina and cysts of the pancreas. He believed that angiomas of the cerebellum occurred in 20 per cent of the cases of retinal angiomas. This association of cerebellar and retinal angiomas has come to be known as von Hippel-Lindau's disease. In none of our cases was there an associated retinal angioma. The cerebral angioblastomas produced symptoms over a longer period of time than did those in the cerebellum. The angioblastomas appeared chiefly during the third and fourth decades, only one case occurring before the third decade.

Tumors of Mixed Tissue

These tumors are now accepted as arising from embryonic rests. If they contain tissues from all three germ layers, they are referred to as true teratomas. Only one such case occurred in our series. When tissues of mesodermal as well as epithelial origin are represented, they are called dermoid cysts. These are usually large cystic masses containing hair, teeth, bone and cartilage.

Only one such tumor was available for study and has been reported in detail (Gray²¹). The most common and simplest type of mixed tissue tumor is the epidermoid (pearly tumor, cholesteatoma). These are sharply circumscribed, irregular, firm and have the external appearance of mother-of-pearl. Histologically but one germ layer is represented, namely the ectoderm. These tumors are composed of a firm fibrous wall whose inner surface is lined by a layer of stratified epithelium, the innermost layer of cells often containing keratohylin granules. Often many flattened structureless cells are seen lining the innermost surface of the capsule. The interior of the epidermoids is composed of a broken down mass of debris consisting of cholesterol crystals and fatty material. Two cases occurred in our series. Both were slow growing and presented symptoms for many years. Since this compilation three more epidermoids have become available and will be incorporated in a detailed study in a separate report.

Hypophyseal Tumors

Both the pituitary adenomas and the craniopharyngiomas have been placed in this group of neoplasms. The latter have frequently been classified with the congenital tumors, but since no separate group of congenital tumors has been included in this study and because of the location and origin of the craniopharyngiomas it was deemed somewhat simpler to consider them with the tumors of the pituitary gland.

The pituitary adenomas, as is well known, may be of three varieties, depending upon the three types of cells found within the anterior lobe of the pituitary, namely, chromophobe, acidophil and basophil adenomas. The latter two are usually small in size and often escape postmortem detection, while the chromophobe adenomas are usually large and distort the chiasm as well as produce numerous clinical symptoms and signs. All are very slow growing, hence, the course in the patient is a long and chronic one with the patient usually drifting away from the original source of observation. For this reason there has been a great scarcity of postmortem tissues available for study. Since the location of these tumors does not lend itself for satisfactory surgery, operative procedures have been avoided unless the rapidly progressive loss of vision or the profound incapacitating headaches have forced such a procedure. Of late fragments of considerable number

of pituitary adenomas have been removed through operative procedures and reported by various authors. In our series the actual number of histologically verified adenomas has been very few (ten of twenty-two cases). In order, however, to balance our statistical studies we have checked our clinical case histories of intracranial tumors and have included twelve cases in which x-ray investigations have definitely substantiated the presence of an adenoma of the pituitary. This produces a total of twenty-two pituitary adenomas or 4.6 per cent of the total intracranial neoplasms, as compared to 17.8 per cent in Cushing's series where operation was more frequent and where no doubt as regards this type of tumor, the material was somewhat selective. In most other series, the percentage follows fairly closely those quoted in this study.

The craniopharyngiomas or pharyngeal duct tumors are usually large irregular growths situated at the base of the brain, often extending upward into the third ventricle. They are usually firm tumors with a well defined capsule. Many are calcified, as well as cystic, containing a viscid yellow fluid. These tumors by their growth compress and destroy the pituitary as well as the optic chiasm and floor of the third ventricle. For purposes of description the craniopharyngiomas have been divided into the adamantinoma and the Rathke Pouch tumors.

The adamantinomas are composed of epithelial columns and are said to resemble the embryonic enamel organ. Twelve such tumors occurred in our series. The duration of symptoms was extremely short as judged from the histories. All but two presented symptoms for six months or less prior to death or operation, while the remaining two presented symptoms for one year and five months respectively. It is generally stated that these tumors occur in the younger age group. This was not entirely substantiated in our studies in which eight of the twelve cases occurred during or after the fourth decade. The majority of cases occurred in the fourth and fifth decades. Our youngest case was six years of age with symptoms having appeared one year previously.

Granulomata

In this group are placed the tuberculomas and the gummas. In our series, these comprised 6.3 per cent of all the intracranial neoplasms. This figure is a little higher than is found in most

other series (Bailey and Cushing, 2.3 per cent; Gogel, 1.4 per cent).

The tuberculomas were four times as frequent as the syphilomas, comprising 80 per cent of all the granulomas. Tuberculomas are uncommonly observed in a general hospital. In most studies the greatest incidence of tuberculomas have been in children. This does not seem to follow in our studies where fifteen of the twenty-four cases occurred during or after the third decade, only seven cases appearing during the first nine years of life. The highest incidence of occurrence was during the third decade in which eight cases appeared. It has been frequently stated that one of the most common locations of a solitary tuberculoma is in the cerebellum. Only eight of our total cases occurred in this organ. Thirteen were found in different regions of the cerebral hemispheres excluding the basal nuclei which alone contained four. Treatment was limited because most of these tumors were either inaccessible or multiple. Surgical removal even in accessible tumors is often inadvisable because it is frequently followed by a meningitis which is invariably fatal. Only four of our cases contained multiple lesions.

Gummas are extremely rare occurrences. Our series contained six cases, all of which were found in the cerebral hemispheres. In recent years due to the intensive antiluetic therapy, this type of lesion has become a medical and pathological curiosity.

Miscellaneous Tumors

Such tumors as colloid cysts of the third ventricle, true cysts usually cerebral in origin, fibroblastomas and chordomas were included in this group. The number of such tumors in our series were too few to warrant discussion. We have studied two fibroblastomas of the brain, both of which have been reported in detail (Baker and Adams,¹⁰ Cottrell¹²).

The metastatic brain tumors are not included in the present statistical analysis, but will form the subject of a future report.

Summary

1. A statistical study of 467 histologically verified intracranial tumors is presented.
2. Eighty-five per cent of the neoplasms were obtained at autopsy, hence, allowing for a careful investigation of the varying histology in the different portions of the tumor.

3. An attempt is made to correlate the various histological types of tumors with the age of the patient, the location within the brain or intracranial cavity and the rapidity of growth.

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SMALL CARCINOMATOUS GASTRIC LESIONS SIMULATING CHRONIC BENIGN ULCER: PRESENT STATUS OF DIFFERENTIAL DIAGNOSIS AND TREATMENT*

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EVEN in this unprecedented era of scientific progress the medical profession cannot view with complacency the fact that 75 per cent of the patients with gastric carcinoma come to the surgeon too late for successful operation. Increased ability to diagnose early gastric carcinoma can be obtained only by more respectful consideration of the accepted precursors of this disease namely, gastric polyps, ulcers and chronic inflammatory changes in the gastric mucosa, and prompt recourse to roentgenoscopic and endoscopic examination of each patient more than thirty-five years of age who suffers from digestive disturbances, however mild, or has lost weight for some unexplainable reason. It is apparent that the rank and file of the medical profession are becoming increasingly conscious of the fact that small or circumscribed, innocent looking ulcerous gastric lesions may be actually or potentially ma-

lignant. Progress in our knowledge in this respect so far is due largely to the disclosures of the fluoroscopic room and the unexpected results of histologic examination of presumably benign excised lesions or lesions in resected portions of the stomach.

If a physician is confronted by a patient harboring a small ulcerating gastric lesion which the roentgenologist has been able to visualize, how may he best determine its possible natures that he may carry out that procedure which will serve the patient's best interests? Obviously, in the absence of a specific biologic test for carcinoma, certain symptoms and signs, or what is more to the point, a grouping of certain symptoms and signs, must be depended on to point the way.

Although it seems logical at the outset to consider the significant features elicited by the anamnesis and gastric analysis, it is really more practical to evaluate the objective evidence presented by the roentgen film. If the patient's phy-

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sician is fortunate enough to have the coöperation of an experienced roentgenologist his opinion should be considered first because he may have made significant observations during the fluoroscopic examination that cannot always be depicted on the ordinary film. He may or may not have a positive opinion regarding the nature of the process.

Significance of Roentgenologic Examination

Two types of malignant gastric lesions may masquerade as chronic benign ulcer, namely, the small ulcerating carcinoma and the less frequent carcinomatous ulcer. The latter is an ulcer without evident tumefaction but which on microscopic examination proves to be carcinoma. In ulcerating carcinoma the cavity produced by the ulceration is usually situated well within the normal confines of the gastric lumen. If the meniscus complex described by Carman and Kirklin, which consists of a meniscal form of crater encircled by a transradial zone representing the approximated overhanging border, can be demonstrated, the lesion almost invariably proves to be malignant. The crater of a carcinomatous ulcer, like that of a benign ulcer, is sculptured as a niche in the gastric wall and invariably projects beyond the normal outline of the lumen. If this niche is large, that is, in excess of 2.5 cm. in diameter, if there is an absence of gastrosplasm and of tenderness on pressure, and if the adjacent rugæ are obliterated or if the margin of the niche is sharply conical or has an irregular profile, then the roentgenologist usually regards the ulcer as carcinomatous. A large niche without these associated features would even be looked on with some suspicion. My roentgenologic colleagues, in the interest of the patient's welfare, lean over backward to regard large size or any irregularity of the lesion as signifying its actual or probable malignant nature. This is evidenced by the latest statistical study, indicating that in 26 per cent of cases in which the lesion was diagnosed by the roentgenologists as questionably malignant the condition was actually benign.

Unfortunately a small carcinomatous ulcer with a small niche may have all the other roentgenologic characteristics of benign ulcer. In the review of a large series of cases, 7 per cent of the lesions unequivocally diagnosed in recent years as benign ulcer by my roentgenologic colleagues were actually carcinomatous.

Significance of Situation and Size of the Lesion

The situation of the lesion is of relative significance in differential diagnosis because lesions that are near the pylorus, on the greater curvature, or well up on the posterior wall of the stomach, have a greater tendency to be carcinomatous than those on the lesser curvature. In our experience at The Mayo Clinic the size of the lesion has a definite bearing on diagnosis, although I realize that this aspect of our problem is still controversial. According to MacCarty,^{11,12} the average diameter of carcinomas of the stomach excised at The Mayo Clinic up to 1931 was 6.1 cm. From 1918 to 1937, inclusive, out of 1,978 carcinomas removed at operation, according to this observer, 128, or 6.5 per cent, of these were small carcinomas (2.5 cm., or smaller, in diameter). By way of comparison, 3,358 cases in which a diagnosis of gastric ulcer was verified either by roentgenologic examination or operation, came under our observation during the same period. In 2,324, or 69 per cent, the ulcer was removed at operation and histologically verified. Alvarez and MacCarty (1928) showed that although the excised benign ulcer is comparatively small, 79 per cent of them being smaller than a dime (1.8 cm. in diameter) and 92.3 per cent smaller than a quarter (2.4 cm. in diameter), 23 per cent of the carcinomas removed were within the size range of benign ulcer (4 cm. or less in diameter). On the basis of the observations of Alvarez and MacCarty my roentgenologic colleagues consider any lesion more than 2.5 cm. in diameter as carcinomatous until proved otherwise. There are, of course, frequent exceptions to the rule. It is apparent that the great majority of benign lesions and thus far a minority of carcinomas are of small size.

From a study of 135 carcinomas and 513 benign ulcers, in which the upper limit for the diameter of the lesions was 4.4 cm., Comfort and Butsch found that on the basis of incidence alone a resectable lesion had approximately four chances out of five of being benign.

Significance of Symptoms

To what extent does a case history contribute to differential diagnosis? The majority of benign gastric ulcers are accompanied by the classic syndrome of ulcer, although not to the same degree or with the same frequency that characterized

duodenal ulcer. A typical history of ulcer favors benign ulcer but does not exclude the possibility of a malignant lesion; contrariwise, an irregular or nonulcer type of history does not exclude the possibility of a benign lesion being present. A change in symptoms in the absence of demonstrable complications, such as pyloric obstruction, penetration, or perigastric involvement, implies, but does not necessarily signify, carcinomatous transformation. Thus, it will be seen that the symptoms per se are only of secondary value in the differential diagnosis. Naturally, in scrutinizing and appraising symptoms, the age of the patient, duration of symptoms and the findings on gastric analysis are considered. Here the observations of Comfort and Butsch are again enlightening. They showed that whatever the duration of the symptoms, the type of history, or the concentration of free hydrochloric acid, and whether or not a change in symptoms has occurred, or gastric retention, or occult blood is present in the gastric contents, a gastric lesion within the size range of most benign ulcers is benign more frequently than it is malignant. "This is especially true when the patient is less than thirty years of age (odds 20:1), when the symptoms are of the ulcer type (odds 5.6:1), when the symptoms are of ten years' duration or longer (odds 12:1), and when the concentration of free hydrochloric acid is greater than 60 clinical units (odds 51:1)."

Further observations with reference to sex, age at time of onset, gastric secretory and motor status and results of examinations of the stool are of interest. Gastric carcinoma and peptic ulcer are three times more frequent among men than among women forty years of age or older; in spite of this fact studies at the clinic have demonstrated that sex does not aid materially in determining whether the lesion is benign or malignant. The difference in the average age of patients with small carcinomas (52.9 years) and with ulcers (48.5 years) is too small to be of any value. We have found, however, that although the incidence of ulcer is greater than that of carcinoma in all decades, ulcer is twenty times more prevalent than carcinoma in the third decade of life. Advanced age and recent onset of symptoms characterize many cases of carcinoma of all types and sizes. One significant combination of circumstances, advanced age, recent onset, reduced acid titer, especially histamine refractory

achlorhydria, irrespective of the size of the lesion, favors a diagnosis of malignancy. The added feature of pyloric obstruction and achlorhydria almost invariably point to malignancy.

Systematic examination of the feces for occult blood under controlled conditions should be a routine procedure, especially when the patient is undergoing treatment in the hospital. Gutmann and his associates, in their recently published volume devoted exclusively to early gastric carcinoma, regarded this procedure as next in importance to the roentgenologic examination. The continuous presence of occult blood after two to three weeks of treatment makes necessary the exclusion of carcinoma; persistent absence of occult blood from the stools is a strong indication of a benign lesion, although it does not entirely exclude carcinoma.

Significance of Gastrosopic Findings

From our experience at the clinic it is not yet clear to what extent gastrosopic examination is helpful in distinguishing between small ulcerous types of carcinoma and chronic benign ulcer. Schindler has maintained that this examination is a valuable procedure and he has described differential aspects of carcinoma and benign ulcer. He stated that the gastrosopic appearance of a lesion may at times be more informative than the observations of the surgeon or pathologist concerning the gross specimen, and second in importance only to the microscopic examination. He has attributed this advantage to the high relief pattern and the brilliantly colored appearance of the living tissue in the gastrosopic picture due to the presence of circulating blood. Palmer, with whom Schindler recently has been associated closely, has expressed the belief that the gastrosopic examination is of great differential value in experienced hands but that it is by no means infallible. It is the better part of wisdom to submit to gastrosopic examination all patients who harbor lesions in which malignancy cannot be excluded, especially if such patients are not going to be promptly submitted to operation.

Significance of Results of Medical Treatment

Regardless of opinions to the contrary, the results of adequate medical treatment are only less decisive in distinguishing a benign from a circumscribed malignant process than surgical removal and histologic examination of the lesion.

I say this with full cognizance of the fact that the physician may be lulled into a false sense of security as the result of such treatment. In the first place, relief from symptoms, even though complete for the time being, is no criterion of

three days later. The gastroscopic appearance was that of a small benign lesion on the lesser curvature and anterior wall distal to the incisura angularis.

The patient was hospitalized and underwent intensive treatment for more than a month. Roentgenologic examination was repeated April 18, 1938, but this failed



Fig. 1. Appearance of stomach: *a*, March 28, 1938, shallow crater on lesser curvature slightly below angle of stomach; *b*, April 18, 1938, crater of ulcer not visible, but area of induration at site of former crater; same picture June 2, 1938; *c*, January 17, 1939, small filling defect of recurrent ulcerating lesion just below angle of stomach; malignancy cannot be excluded.

benignancy. Neither is progressive diminution of the niche, and in *rare* instances, neither is its complete disappearance even when confirmed by roentgenologic and gastroscopic examination, as illustrated by the following case.

Case 1.—A man, aged sixty-eight years, came to The Mayo Clinic on March 21, 1938, because of stomach trouble. In 1923 and 1928 he had experienced brief periods of gastric distress coincident with unusual nervous and physical strain. This distress, which was characterized as gas, and hunger pain, was situated in the epigastrium and appeared about two hours after each meal. On relief from occupational stress the symptoms promptly disappeared. The present illness began about three months prior to his admission to the Clinic, during the Christmas holiday (December, 1937). Epigastric distress appeared about one hour after each meal and persisted for several hours. Alkalis or milk afforded relief. There was no impairment of weight, appetite or strength. In February, 1938, a gastric ulcer was diagnosed after a roentgenologic examination. Ambulant treatment for ulcer was promptly instituted and the symptoms disappeared. Because there was not a proportionate improvement in the roentgenologic appearance of the lesion, the patient was referred to the clinic for an opinion.

The general physical examination gave satisfactory results. The patient was short, stocky and well nourished. Gastric analysis following an Ewald meal revealed a total acidity of 32 clinical units and free hydrochloric acid, 20. The total contents removed measured 125 c.c. Roentgenoscopic examination on March 28, 1938, revealed a shallow ulcer on the lesser curvature just below the incisura angularis (Fig. 1*a*). Its presence was confirmed by gastroscopic examination

to disclose any sign of the ulcer (Fig. 1*b*). On gastroscopic examination on July 7, 1938, the original ulcer had disappeared completely. Roentgenologic examination on September 14, 1938, again revealed normal conditions. The patient had experienced none of his previous distress in the meantime. He was, however, asked to return periodically for reexamination on account of his advanced age and the recent onset of the symptoms. On January 17, 1939, there was roentgenologic evidence of a recurrence of the ulcerating lesion (Fig. 1*c*). Two days later gastroscopic examination revealed the lesion as depicted on the film. It was situated at the original site and appeared to be fairly well circumscribed, somewhat indurated, and 2 cm. in diameter. On June 25, 1939, partial gastrectomy was performed.

The pathologic findings were as follows: An ulcerating colloid carcinoma grade 3, measuring 2 by 2 by 1 cm. situated on the anterior wall and lesser curvature of the stomach, 3 cm. above the pyloric ring. The serosal surface of the stomach immediately underlying the ulcer showed carcinomatous lymphangitis. No lymphatic involvement was found (Fig. 2).

The patient was examined again on February 13, 1940, and appeared to be in excellent health. He had no disturbances of any kind and the examination failed to reveal any evidence of recurrence.

Templeton and Schindler recently reported that in five of a series of eighteen cases which had been carefully observed during medical management, and in which from a roentgenologic standpoint the lesion apparently had healed, shallow craters were still present on gastroscopic examination. It seems, therefore, that gastroscopic confirmation of roentgenologic evidence of complete healing is essential. However, with few ex-

ceptions, the complete and permanent disappearance of all symptoms and signs that can reasonably be attributed to the ulcer is usually reliable evidence of its benignancy. On the other hand, some sclerosed, indurated or perforated benign lesions will not heal, and the niche may persist in whole or in part. Even an uncomplicated ulcer may undergo complete healing, with persistence of the niche, as demonstrated by Unger and Poppel. That this should not occur oftener has frequently intrigued me when one considers the fact that the bulbar deformity caused by most duodenal ulcers will persist after such ulcers are healed. Small ulcerating carcinomas usually undergo few morphologic changes as a result of treatment. In some the crater actually enlarges. In rare instances, as pointed out by Rigler, the niche may disappear roentgenologically because the carcinoma has grown into the base of the ulcer. Occasionally the crater of lesions eventually proved malignant decreases in size, but as a rule the other signs, occult bleeding for example, or the symptoms, or both, may persist or recur within a short period.

The necessity for periodic reëxamination of patients who have had medical treatment only is important at all times and especially when such patients are past middle life. The possibility should be kept in mind that patients with chronic ulcers may undergo treatment at a time when the carcinomatous changes in the ulcer are microscopic and therefore an apparent cure may be secured temporarily. In MacCarty's experience the smallest carcinomas involve only the mucosal borders of the ulcer. This observer is also of the opinion that approximately 10 to 15 per cent of all chronic gastric ulcers undergo early and late changes which cannot be detected by any procedure other than microscopic examination. The necessity for further adequate supervision of patients treated medically is indicated by the fact that even these small lesions may be highly malignant and therefore their true nature should be determined without unnecessary delay. This fact was strikingly exemplified in the case reported by Rivers and Dry, of a young man aged twenty-seven years, who had two gastric lesions, the smaller one being carcinomatous. Balfour stated that the five-year survival of patients who had large malignant lesions of the stomach (60 sq. cm.) after operation was 10 per cent more than that of patients who had small malignant lesions

(20 sq. cm.). In explanation of this he concluded that the smaller lesions are more likely to be of a penetrating character and of a higher degree of malignancy than the larger ones. Among sixty-eight patients with small carcinomas or carcino-



Fig. 2. Ulcerating colloid carcinoma measuring 2 by 2 by 1 cm.

matous ulcers observed by Alvarez and MacCarty, thirty-six, or about 53 per cent, were dead within one and a half years following operation, presumably of recurrences.

It seems appropriate to revert to the moot subject of the relation of ulcer to carcinoma. That chronic ulcers, like adenomatous polyps, and chronic gastritis are the precursors of carcinoma is generally accepted today. There is considerable difference of opinion as to the incidence of carcinoma in ulcers. A minority of investigators, such as Palmer and Klein, take the extreme viewpoint that an ulcer rarely, if ever, undergoes carcinomatous transformation. With such an irreconcilable viewpoint we at the clinic cannot agree, on the basis of our own clinical and pathologic evidence. In a critical study of the histories of eighty patients who had undergone gastric resection for small ulcerous malignant lesions, Eusterman and Bueermann noted that 52 per cent of the patients had presented symptoms characteristic of benign ulcer with an average duration of such symptoms of eleven years. Eighty-two per cent of these had free hydro-

chloric acid in the gastric content. To ascribe such antecedent symptoms to nervous indigestion or other unlikely causes is, to my mind, begging the question. To what extent such symptoms could be ascribed to gastritis remains to be proved. In this connection, Konjetzny's well known observations in this field lead him to believe that carcinoma may develop in the edge of a benign ulcer or adjacent to the ulcer, but independent of it, related not to the ulcer, but to the gastritis, to which this authority attributes both the ulcer and the carcinoma.

A reasonable question is why not operate at once in every instance? In the first place, the great majority of small gastric lesions are benign, and many of the uncomplicated gastric ulcers heal readily. It is reasonable to presume that complete healing forestalls eventual carcinomatous changes. In the second place, as emphasized by Bloomfield and many other internists before him, gastric resection in the hands of the average surgeon is attended by a mortality sufficiently high so that the outlook for the patient will not be improved unless the menace of carcinoma exceeds the operative risk.

Summary and Conclusions

Carcinoma in its earlier stages is still diagnosed too infrequently. Circumscribed innocent looking ulcerous gastric lesions may be actually or potentially malignant. Satisfactory differential diagnosis, in the absence of a specific biologic test for carcinoma, is frequently impossible without recourse to microscopic examination of the lesion. On the basis of repeated clinical and pathologic observations, certain diagnostic criteria of relative or absolute value in differential diagnosis have been evolved.

The typical benign ulcer is small, usually not exceeding 2.5 cm. in diameter, and has certain familiar roentgenologic characteristics. When the patient is thirty years of age or less, a small ulcerous lesion associated with 40 units of free hydrochloric acid in the gastric contents after the Ewald meal is usually benign. A concentration of free hydrochloric acid of 60 or more clinical units (Ewald) also strongly favors benignancy. The benign nature of the lesion is also characterized by the permanent disappearance of all symptoms and signs following adequate medical treatment, irrespective of age, nature or duration of symptoms, or size or location of the lesion.

Although about a fifth of all malignant gastric lesions may be within the size range of benign ulcer (4 cm. or less in diameter) only 6.5 per cent of carcinomas are small ones (2.5 cm. or less). At least 5 per cent of lesions unequivocally diagnosed in recent years by our roentgenologists as benign ulcer were actually carcinomatous. The meniscus complex for all practical considerations is pathognomonic of ulcerating carcinomas, irrespective of size. The roentgenologic characteristics of carcinomatous ulcer are less definitive than the meniscus complex. Large niches are regarded with suspicion, but a large ulcer is not necessarily malignant. Other features suggestive of the possible malignant nature of the lesion are an elderly patient with late onset of symptoms, the combination of histamine refractory achlorhydria and pyloric obstruction, persistent occult blood in the stool during and after treatment, incomplete response to adequate treatment, and situation of the lesion near the pylorus, on the greater curvature or posterior wall, as well as certain features elicited by the gastroscopic examination.

The presence of a gastric lesion, however small, makes imperative adequate medical treatment and observation, if exploratory operation is not undertaken. This applies in particular to the middle-aged or elderly individual. Treatment is justifiable when the lesion is not frankly malignant as the majority of uncomplicated gastric ulcers heal readily under favorable conditions, and gastric resection, under average conditions, still carries a much higher mortality than the risk of death from carcinoma. The nature and degree of response to treatment are also important factors in differential diagnosis.

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THE SURGICAL TREATMENT OF GASTRIC CANCER MASQUERADING AS BENIGN DISEASE*

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THE frequency of malignant lesions in the stomach in contrast to their rarity in the duodenum brings to gastric ulcer a special significance. Only constant recollection of this fact leads to rational treatment of such lesions. Though the gastric ulcer is less commonly encountered in clinical practice than duodenal ulcer—according to Eusterman and Balfour¹ one-twelfth as often at The Mayo Clinic—its presence is sufficiently common to deserve careful attention. In 1938¹⁰ at The Mayo Clinic a diagnosis of gastric ulcer was made in 178 cases and operation was performed in eighty-four, or 47.2 per cent. In the same year a diagnosis of duodenal ulcer was made in 2,215 cases and operation performed in 328, or 14.8 per cent. In 1939 there were 207 patients for whom a diagnosis of gastric ulcer was made and 109 were operated on, an incidence of 52.6 per cent. In 1939 a diagnosis of duodenal ulcer was made in 2,729 cases and operation carried out in 467, or 17.1 per cent. Unfortunately, too often gastric and duodenal ulcers are grouped under the misleading title of “peptic ulcer” and their inherent dissimilarities are neglected. They are thus not recognized as occurring in individual types of tissue in which there is a difference both in pathologic reaction and in response to medical and surgical treatment.

A large, chronic gastric ulcer (more than 2.5 cm. in diameter) in a patient more than forty years of age, especially if the complications of perforation, obstruction or hemorrhage have

been present, or one on the greater curvature or near the pylorus usually should be removed surgically without delay, as few of these lesions respond to nonsurgical treatment and many of them may be carcinomatous. The small gastric ulcer which has failed to heal or has recurred under adequate medical management should be removed surgically, for, if the lesion is malignant, it is frequently of high degree.

The incidence of malignant changes in gastric ulcers has been estimated to be from 10 to 20 per cent. Katsch found an incidence of 20 per cent, and Walton stated that the figures of Stewart are generally accepted, namely, that 9.5 per cent of chronic gastric ulcers became carcinomatous and that 17 per cent of cases of carcinoma of the stomach originated in chronic ulcer. Walton called attention, however, to a probable higher incidence in view of the fact that many of the carcinomas, when removed, are found to be so large that it is impossible to tell whether they might have originated in an ulcer or not. In a recent study⁹ at The Mayo Clinic of 100 consecutive cases in which small, presumably benign gastric lesions were removed, the lesions in nineteen were found to be carcinomatous on pathologic examination.

There are several satisfactory procedures that may be employed in the surgical treatment of gastric ulcer. The procedure of choice is partial gastrectomy with removal of the lesion. The advantages of this procedure are the removal of the lesion with its possible hemorrhage, perforation or malignant degeneration, riddance of associated pylorospasm and induction of a high incidence of relative achlorhydria with almost total

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absence of gastrojejunal ulceration. The Polya type of end-to-side anastomosis posterior to the colon is utilized most frequently. If the lesion should prove, on microscopic examination, to be malignant, its removal by partial gastrectomy gives the patient the best chance of cure, for it removes the lymphatic regions in the wall of the portion of the stomach removed and in the adjacent gastroduodenal and gastrohepatic omenta, which might harbor malignant cells which extended from the original lesion.

The Billroth I type of anastomosis after partial gastrectomy is a satisfactory treatment of gastric ulcer and carcinoma in selected cases. It is particularly useful in instances in which the duodenum is mobile and the lesion is in the pyloric one-third of the stomach, for, under these circumstances, the end-to-end anastomosis can be made without tension on the suture line. The risk of performing this operation in the experience of some surgeons has been somewhat greater than that of the Polya type of resection unless the cases are carefully chosen. It was noted by one of us (Walters) and Clagett in a study of 272 consecutive operations for gastric ulcer performed at The Mayo Clinic that this procedure was used but twenty-two times in contrast to the Polya operation, which was used 131 times. It should be emphasized that the satisfactory results from the Billroth I procedure for gastric ulcer are not duplicated in as high a percentage of cases as in operations of similar type for duodenal ulcer. This is probably due to the fact that the Billroth I operation produces a relatively high incidence of postoperative achlorhydria in gastric ulcer and does not in duodenal ulcer.

When partial gastrectomy cannot be safely utilized, on account of the poor general condition of the patient or the nature of the lesion itself, surprisingly good results may be obtained by less radical methods, such as excision of the ulcer with gastro-enterostomy or occasionally by excising the ulcer alone. It is to be repeatedly emphasized that, when possible, removal of the lesion in some manner should be done. Finsterer, in a study of 532 consecutive resections for gastric ulcer, found 141 lesions to be carcinomatous. Of these 141 carcinomatous lesions he found forty-one which he could not macroscopically distinguish from benign ulcer, and only by pathologic study was the sinister na-

ture of the lesion brought to light. By local excision of the ulcer with knife or cautery and gastro-enterostomy, pathologic study of the lesion to tell its exact nature is possible, and protection against further ulceration is accomplished by reduction of acidity by the gastro-enterostomy. This was done fifty times with very good results in the series of 272 cases studied by one of us (Walters) and Clagett.

Excision with knife or cautery may occasionally be done without gastro-enterostomy but it is not recommended because it does not offer an alteration in gastric physiology to prevent recurrence.* In the occasional case it has been utilized with rather surprisingly good results. It does enable microscopic study of the lesion. Similarly, segmental or sleeve resection may be done to remove the lesion, but disturbance in gastric peristalsis may follow in its wake, in addition to the fact that little change in gastric physiology results. It has been used with some success in selected cases, however.

When the condition of the patient is such that removal of the lesion is impossible without too great risk, then as safe a procedure as possible should be done which sufficiently alters the conditions that healing of ulceration may be anticipated. No one by choice desires to leave behind a gastric ulcer with the menace of malignancy in it, but if survival of the patient is deemed impossible with its removal, some less satisfactory procedure must be done. In this predicament, providing the lesion is benign, experience at the clinic has shown that gastro-enterostomy may be satisfactory. With the relative achlorhydria which frequently follows, a recalcitrant gastric ulcer¹ may heal with this alone. Eusterman and Balfour showed that 79 per cent of 100 patients on whom gastro-enterostomy had been performed for gastric ulcer were well after five years. This procedure of low risk, 3.9 per cent for 540 cases according to Eusterman and Balfour,² is thus worthy of consideration when conditions make removal impossible. The palliative resection of Madlener, in which the ulcer is also left behind, has not been utilized at the clinic. Lewisohn says the results of the Madlener operation, when viewed in a large series, are unsatisfactory. Jejunostomy is not utilized because of the necessity of prolonged treatment and fre-

*Reduction of gastric acidity and relief of pylorospasm.

quency of recurrence of the ulcer following discontinuance of the jejunal feedings.

Results of Operation

The results from well-chosen surgical treatment of gastric ulcers are among the best in surgery. In forty-three of sixty-two patients with benign gastric ulcer, or approximately 70 per cent, operated on at The Mayo Clinic in 1938, partial gastrectomy was performed with one death, or a mortality of 2.3 per cent.¹⁰ Most of these procedures were of the posterior Polya type. One of us (Walters) and Clagett in a study of 272 patients with gastric ulcers operated on between January 1, 1933, and January 1, 1937, found that 131 patients with gastric ulcer had the posterior Polya type of resection. Of the 131, eighty of eighty-five patients who responded to the questionnaire and had this type of operation were in excellent health without distress, while five were in good health with only slight occasional distress.

The high location of a gastric ulcer should not prejudice against surgical treatment, when surgical management is indicated. We have shown that many of the benign cardial gastric ulcers can be removed with a risk of less than 4 per cent, in other words, not appreciably greater than for removal of ulcers in the body of the stomach. For example, thirty-five benign cardial gastric ulcers were treated surgically with one death at The Mayo Clinic in 1938 and 1939 (mortality 2.8 per cent). The cardial gastric carcinomas, of which there were thirty-four in 1938 and 1939 with five deaths (14.7 per cent mortality) were removed by partial gastrectomy with a risk comparable to that of resection for carcinoma of the stomach in general. For comparison, 126 partial gastrectomies were performed for carcinoma of the stomach at The Mayo Clinic in 1938 with a mortality of 13.4 per cent. Often the ulcerating gastric lesion appears to be located higher in the roentgenogram than it actually is, because perforation of the ulcer onto the capsule of the pancreas or gastrohepatic omentum may foreshorten the stomach proximal to the lesion. In such cases high ligation of the gastric artery, division of the gastrohepatic omentum above the lesion and mobilization of the perforating lesion usually demonstrate an adequate amount of stomach available for safe resection. Thus, any patient

with gastric ulcer for which surgical intervention is thought best should not be deprived of the benefits of operation because the lesion seems to be high, on roentgenographic or gastroscopic examination.

Summary

Gastric resection is the surgical procedure of choice in the management of gastric ulcer and the best results follow the posterior Polya type of partial gastrectomy. Removal of the lesion should be accomplished wherever possible; a simple excision, combined with gastro-enterostomy, gives very satisfactory results when the lesion is benign but cannot be safely removed by partial gastrectomy. When the lesion seemingly cannot be removed with safety, gastro-enterostomy is favored over the Madlener palliative resection or jejunostomy. The results of a properly performed, well-chosen surgical procedure for chronic gastric ulcer are among the best in surgery today, and no patient should be deprived of surgical treatment because of the large size of the lesion or its apparent inaccessibility when viewed radiographically, for such lesions may be more accessible than the roentgenologic examination would indicate. The preoperative differential diagnosis between a benign and a malignant ulcer is difficult and the roentgenologic report that a gastric ulcer is present does not exclude the possibility that it may be malignant. In fact, in 100 consecutive cases of reported "gastric ulcer" the lesion was found to be carcinomatous in nineteen.

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INDICATIONS FOR USE OF IRON IN TREATMENT OF THE ANEMIAS*

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THE work of Whipple, Castle, Rhoads and a host of others has given clinicians a great deal of light on much that pertains to normal and abnormal erythropoiesis. There is still a place, however, for clinicians to introduce into practice an orderliness in applying these gifts of researchers. Obsolete and confusing nomenclatures must be gradually displaced. The terms "primary" and "secondary" as applied to anemias should be used with greater discrimination. Addison's anemia is no longer "pernicious" but has been established as a deficiency disease in a conditioned individual. When an accurate diagnosis is followed up with adequate and persistent fortification of the diet with the deficient factor as represented by gastric or liver extract, the patient will remain well. A variety of other conditioning and nutritional interruptions account for a series of anemias of nearly identical type.

In a similar manner the investigations of Whipple and Robschey-Robbins^{13,14,15} on the diet and iron requirements of their "standard anemic" dogs have illuminated to a remarkable extent the problem of the large group of anemias associated with hypochromia and iron deficiency. Such terms as "primary" or "idiopathic hypochromic" anemia are likewise doomed to become obsolete since the circumstances attendant upon iron metabolism, bodily storage, availability, and sources of iron loss have become so thoroughly understood.

A combination of these types of anemia, representing both maturing and iron deficiency factors, occurs uncommonly. Thus we may say that the therapeutic indications on the one hand to stimulate red cell maturation and on the other to adequately stock the body with sufficient iron for hemoglobin production, are so definite as to make the various combinations of liver extract and iron as illogical as they are expensive. An individual in whom liver therapy is indicated will need continuous and persistent treatment during life. This situation does not obtain in the iron deficiency group for once the reserve has been replenished and causal factors eliminated, the ne-

cessity of further treatment ceases. Furthermore, the use of such combinations greatly increases the probability of inadequate dosage of whichever factor chances to be the required one.

I propose to hold this discussion to the several circumstances which lead to depletion of the iron stores in the body. This will involve consideration of dietary deficiencies, of disturbed absorptive facilities, of liver inadequacy in its relation to hemoglobin protein metabolism, and finally of the channels through which body iron is lost. Where such circumstances obtain, the most common of all blood conditions—hemoglobin deficiency anemia—results.

The hemoglobin molecule is large and consists of two component parts. Hematin, the smaller of these, carries all the hemoglobin iron combined with its protein. It has been shown that the body is able to synthesize all material necessary in the formation of new hemoglobin except iron. Some highly significant investigations have recently been reported by Whipple¹² demonstrating that certain relationships exist between hemoglobin proteins and the plasma and fixed tissue cell proteins. By starvation experiments with his standard anemic dogs, he was able to show that during such stress an important exchange of proteins would occur from the tissue cells to the hemoglobin and that this reaction was not reversible. The rôle played by the liver in this exchange of protein from tissue cells and plasma to hemoglobin, appears to be that of an important assembling and distributing station. He demonstrated, furthermore, that the plasma and hemoglobin proteins in these dogs were controllable by diet and that certain foods have a specific effectiveness in stimulating the production of new hemoglobin. In view of such observations one may emphasize the therapeutic importance of a quantitatively as well as qualitatively adequate protein intake.

Although minute traces of iron are known to be present in all tissue cells, the bulk of this element is contained in the circulating hemoglobin. It has been estimated that the normal adult human body contains an approximate total of four and one-half or five grams of functioning iron.

*Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

Of this total, approximately ten per cent is tissue cell iron and sixty per cent is combined in hemoglobin. The remaining thirty per cent, about one and one-half gram in amount, is stored in available depots as the liver, marrow, and spleen, to be used in the production of new hemoglobin as need arises. This then represents the so-called normal iron reserve. Other iron deposits may be found in body tissues and organs in an entirely non-functioning capacity. In conditions as hematochromatosis and in hemosiderosis, these foreign-body-like deposits may be very extensive, but do not under any known circumstances become available for use.

The iron conserving mechanism of the body is equally remarkable in that none of this iron reserve is lost in any appreciable degree through excretion. When hemoglobin disintegrates to form bilirubin and the other bile pigments, the iron bearing hematin is split off early in the process to be conserved within the body and apparently reutilized in the formation of new hemoglobin. What, then, are the sources of loss of iron from the body, and through what channels may this reserve be depleted? We may say specifically that this may occur only through the processes of bleeding, of pregnancy and lactation, and of growth.

To lose hemoglobin through blood loss is to lose iron. By simple calculation one can assume, theoretically at least, that a normal individual, having lost one-half of the blood in the body through acute hemorrhage, may restore the blood level to normal without receiving any iron from extraneous sources. This would be accomplished, of course, at the expense of the entire iron reserve; and the replenishment of the same would become the immediate physiological problem. More insidious depletion ensues as a result of chronic and recurring blood loss. The anemia-producing effect of daily bleeding from hemorrhoids and from gastro-intestinal malignancies is generally known. The commonest instance, however, is menstrual bleeding with its almost universal depression of hemoglobin values during this period of life. Minot^{7,8} states that the iron requirement in women during their menstrual life is four times that of men. It seems entirely consistent, therefore, that the severe types of hemoglobin deficiency, chlorosis and so-called idiopathic hypochromic anemia, occur almost exclusively in females.

The hemoglobin deficiency in chlorosis, which in its severe form was relatively common three or four decades ago, undoubtedly results from the additional strain of menstrual blood loss in girls in whom the iron reserve has been seriously lowered by recent rapid growth plus inadequacies in diet and absorption facilities. Most investigators and clinicians feel that mild cases of chlorosis are not altogether uncommon even at present and advocate the routine prophylactic administration of iron to adolescent girls.

The appearance of severe hemoglobin deficiency anemia in women nearing the end of their menstrual life produces a characteristic clinical picture. These patients, by virtue of anacidity or some other factors inhibiting absorption of iron from the gastro-intestinal tract, have been unable to maintain a positive iron balance against the inroads made by years of menstruation and, frequently, numerous pregnancies. This condition occurring in men invariably means chronic blood loss, and painstaking investigation must be resorted to until the bleeding source has been identified. Serious hidden pathology may be the answer to such investigations. After elimination of the bleeding source and adequate administration of inorganic iron, it has been common experience that further treatment may be discontinued without fear of recurrence.

Pregnancy is invariably associated with some decrease in hemoglobin level. This occurs in part as a result of the physiologic increase of blood volume during the latter part of pregnancy with hydremia accounting for ten or twenty per cent dilution of the blood solids. However, the developing fetus requires its blood building pabulum and takes its apportionment of iron from the mother. In the case of a normal full term fetus, born with an average hemoglobin complement of 120 per cent (regardless of the status of its mother's iron store), this would represent a loss to the maternal supply of approximately 500 milligrams of iron, or the equivalent of one liter of blood. Strauss and Castle,^{9,10,11} from extensive observations on anemias of pregnancy, concluded that the essential causal factors were dietary deficiencies, mal-absorption from the gastro-intestinal tract usually in association with diminished gastric acidity during the third trimester, and the demands made by the growing fetus on the mother's iron supply. Thus we see the reason why iron becomes such an important adjuvant in

the dietary care and safeguarding of the pregnant woman.

From the standpoint of the infant, the iron reserve may be deficient if the maternal supply is low. This may be gathered from observations indicating that after the first year of life the hemoglobin level of an infant born of an anemic and untreated mother will usually fall to approximately 40 per cent. In contrast to this are the hemoglobin values of 80 per cent plus usually noted in one-year-old infants whose mothers' blood counts, if not normal during pregnancy, had been sufficiently bolstered by iron therapy during this period. Obviously, the hemoglobin values of prematurely born infants and of multiple pregnancy babies need special attention because of the probability of a subnormal iron endowment at birth.

Depletion of the iron store through growth occurs as the result of the sharp demand for new red blood cells to satisfy the rapidly enlarging and spreading blood volume. This becomes most apparent during the periods of greatest change in growth ratios, as during infancy and adolescence. During childhood, with enhanced dietary intake and a slowing of the growth ratio, anemia is not usually evidenced unless faulty iron absorption ensues due to circumstances as infections, gastric anacidity, or capriciousness of eating habits. Heath^{1,2} has expressed as his opinion that iron should be administered routinely to all infants after the age of three months, to adolescent girls and to pregnant women.

Having considered these three sources of loss of bodily iron, and the depleting effect on the iron reserves, attention must be given to the mechanism of restitution. The faculty of absorbing and making available for use sufficient iron is influenced by numerous adverse circumstances, many of which have been referred to in the preceding discussion. The dietary intake must be adequate in all respects, in protein, in vitamins as well as in iron containing foodstuffs. Besides this there must be the will to eat and a properly attuned gastro-intestinal tract to insure normal absorption. This implies an availability in the digestive processes of hydrochloric acid and of bile and an absence of such deterrant factors as hepatic inadequacy, chronic diarrheal states, intestinal fistulæ, hypothyroidism, and avitaminosis. Under favorable circumstances the rate of absorption of iron is controlled largely by the demand. In severe

depletion, Heath^{3,4,5} has shown that injected iron can be recovered quantitatively as hemoglobin, thus indicating the avidity with which the body may take up iron if available.

Under normal circumstances the body is able to replenish a depleted iron store from dietary source alone but at a relatively slow rate. Approximately 25 milligrams of absorbed iron is required to synthesize enough hemoglobin to raise the level one per cent. When one considers that only about 5 milligrams daily are absorbed from an adequate food intake, simple calculation would indicate that some fifty days would elapse before a rise of ten per cent in hemoglobin level could be expected. When by common experience this absorption rate is accelerated ten or fifteen times by the addition of an excess of inorganic iron to the diet, the indication for gross iron therapy becomes obvious.

It is of greater concern in iron therapy that adequately large doses of inorganic iron be given than that any particular form or combination be used. The more soluble iron compounds have come into favor because the effective dose is smaller. The necessity of giving infants and children relatively larger dosage per kilo has been emphasized by Meulengracht,⁶ who incidentally was one of the first to point out the fallacy, so prevalent in the first quarter of our century, of treating low hemoglobin anemia with small, supposedly stimulating doses of iron, frequently in the form of ineffective organic combinations. The technic of iron therapy in very weak infants and prematures seems to be beset with danger of serious gastro-intestinal irritation. Minot⁷ points out the ineffectiveness of administering iron solutions in milk owing to the formation of insoluble phosphates which are not readily absorbed. The fallacy of using combinations of liver extract and iron in routine treatment of anemia has been previously pointed out. Although Hart and Steenbock have demonstrated that minute amounts of copper are essential in the utilization of iron, therapeutic attention to this combination is in all probability unnecessary because of the almost universal contamination of foods and commercial iron preparations by sufficiently large traces of this element. The parenteral use of iron should be mentioned merely to discourage it. Heath has stated that injected iron may be very toxic in doses approaching therapeutic value. The parenteral administration of

25 milligrams which, if entirely utilized, will elevate the hemoglobin level only about one per cent, may cause severe local reactions, as well as nausea and vomiting. If necessary to employ this method, a ten per cent solution of ferric ammonium citrate may be injected intramuscularly in doses not exceeding one cubic centimeter.

I have attempted to outline the fascinating, yet quite simple, principles dealing with bodily iron, its physiology and the mechanism of restoration therapy. The three great sources of iron loss to the body are found incidental to the growth factor in infancy and adolescence, to the apportionment of the mother's iron to the infant during pregnancy and lactation, and to the loss incidental to bleeding. Persistent consideration of these factors opens up for us the main indications for iron therapy. Appreciation of the principles underlying iron deficiency anemia is as stimulating to diagnostic acumen as it is to effectiveness of preventive and curative therapy.

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TOXIC EFFECTS OF CARBON TETRACHLORIDE

Report of Case

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CARBON TETRACHLORIDE is a chemical used in industry and also used for therapeutic purposes. Physically it is a colorless, transparent fluid, derived from methane, having the formula: CCl_4 . It is similar to chloroform but is more toxic. It is volatile at ordinary room temperature and is about five times as heavy as air. Its volatility makes it accessible for inhalation and its density makes ventilation of buildings difficult. The chemical is readily absorbed through the lungs, integument and gastro-intestinal tract. There are numerous occupations in which the workers may be exposed to vapor from carbontetrachloride: in dry cleaning, shoe dye establishments, in the manufacture of certain paints, in the vulcanizing industry.¹² Numerous cases of toxic effects have been reported from the industries.^{4,11}

Oral administration⁴ of carbon tetrachloride has been used in hookworm therapy since 1921^{2,3} and Lambert⁵ reported in 1933 over 100,000 consecutive treatments without a death and with few un-

toward symptoms. However, toxic effects were reported by Lamson, Minot and Robbins⁶ in alcoholics or in those who ingested alcohol soon after treatment. They also found that the taking of fatty foods hastened the appearance of toxic symptoms. It was also observed that animals on a diet low in calcium were more susceptible to carbon tetrachloride poisoning and that animals on diets to which calcium carbonate or calcium lactate had been added showed a tolerance to the drug.

The inhalation of fumes of carbon tetrachloride causes acute symptoms which are chiefly narcotic similar to the anesthetic effects of related drugs. However, the toxic effects to the liver and kidneys may become manifest at a later time, from twenty-four to thirty-six hours after exposure.^{7,9} One hundred parts of carbon tetrachloride per million parts of air is generally considered the maximal, allowable concentration for any prolonged exposure.¹ Madding and Butt⁸ have reported a case of hepatitis from inhalation of

fumes. Hans Smetana¹⁰ has called attention to the renal symptoms of poisoning by this drug, which soon overshadow the symptoms of hepatic damage and presents a characteristic clinical picture which is so typical that one may be led to the correct diagnosis merely from observation of the symptoms and interpretation of the laboratory findings, even in the absence of the history of carbon tetrachloride poisoning. The laboratory findings indicate a severe hepatitis and an accompanying or subsequent kidney damage, which have been confirmed by autopsy material. The gross anatomical findings were central necrosis of the liver and microscopic studies showed marked renal nephrosis. Smetana has suggested that an analysis of the cases of carbon tetrachloride poisoning reported in the literature indicates a greater percentage of renal symptoms in those cases of poisoning due to inhalation.

A brief description of the clinical symptoms of the immediate and late effects of poisoning by carbon tetrachloride will be presented in outline form along with the usual laboratory findings considered of value in arriving at a diagnosis.

Clinical Effects of Carbon Tetrachloride Poisoning

Immediate effects: (three to twenty minutes)

1. General: Headache, dizziness, general malaise, loss of consciousness (narcotic) or death by paralysis of vital centers.
2. Local: Irritation of oral, nasal and conjunctival mucous surfaces.

Delayed effects: (twelve to thirty-six hours)

1. General: Headache, muscle pains, general malaise.
2. Local: Inflammation of mucous membranes noted above.
3. Visceral: Nausea, vomiting, hematemesis, diarrhea.
4. Hepatic: Abdominal pain, tenderness in abdomen, jaundice (icteric index 12 to 30).

Late effects: (two to eight days)

1. General: Headache, vertigo, general malaise.
2. Local: Sub-conjunctival hemorrhages, hemorrhagic diathesis, inflammation of mucous membranes.
3. Visceral: Nausea, vomiting, diarrhea, colicky pains in abdomen, bloody stools or hematemesis.
4. Hepatic: Signs of hepatitis (liver enlarged and tender). Jaundice increases (icteric index 30 to 90).
5. Renal: Oliguria, anuria, generalized edema, uremic coma (suppression of renal function).
6. Central Nervous System: Epileptiform convulsions, increased blood pressure, increased muscle tonus, hiccough and stupor.
7. Other effects: Pulmonary edema (Variable).

Laboratory Findings in Carbon Tetrachloride Poisoning

Blood cytology:

1. Red blood cells: Polycythemia early.
Anemia later
2. White blood cells: leukocytosis up to 35,000 cu. mm.
Later returns to normal.

Blood chemistry:

1. Non-protein nitrogen: increased to 200 mg.
2. Urea content: increased to 200 mg.
3. Creatinine content: increased to 12 mg.
4. Carbon dioxide combining power: lowered.

Icteric Index:

1. Early—12 to 30.
2. Late—30 to 90.

Urine:

1. Specific gravity: no significant change.
2. Sugar: negative.
3. Albumin: two to four plus.
4. Microscopic: Red blood cells, 10 to 200 per high power field.
White blood cells: 20 to 100 per high power field.
Casts: many with predominance of hyaline forms.

Blood pressure:

1. Early, very little change.
2. Late, readings of 200 to 300 mm. Hg. systolic and readings of 90 to 120 mm. Hg. diastolic.

Case Report

A thirty-one-year-old white man, a salesman, was admitted to the hospital on December 6, 1938, because of general malaise, nausea, vomiting, diarrhea and numbness of the extremities. Three days previously he had used a "Pyrene" fire extinguisher to put out a small fire in the upholstering of his automobile and had inhaled considerable smoke and fumes with no immediate deleterious effects except a burning sensation in the nose, throat and of the conjunctivæ. These latter symptoms had persisted to the time of his admission to the hospital.

Present Illness.—Immediately after exposure to the fumes of the smoke and fomite from the fire extinguisher, to which he was exposed for about one-half hour, he took one or two alcoholic drinks and states that he felt well that night. On awakening the following morning he had some general malaise and later developed a severe headache. He then noted some abdominal discomfort and became nauseated and vomited several times. That evening he noted a looseness of the bowels with several watery stools. He slept poorly that night and on the second day had persistence of the malaise, nausea, vomiting, diarrhea and headache. He then noted that the conjunctivæ were injected and sore and that he had some numbness of the extremities. He was coughing and expectorating a greyish sputum. On this day he took some "Alka-Seltzer" and some Peppermint Water (2 per cent) and states that he did not

retain these nor any food or liquids taken during that day. He further stated that his urine was cloudy but seemed to be normal in amount. He consulted his physician on December 5 and was sent to the hospital the following day, which was the fourth day after exposure and the third days of his illness.

Physical Examination.—The patient, well nourished and well developed, appears to be acutely ill, but is intelligent and coöperative. The conjunctivæ are injected and an ecchymosis is present in both sclera and conjunctiva. The skin has a bronzed color and is dry. The temperature was 98.6 F., the pulse rate 90 and the respiratory rate 20. The blood pressure was 120 mm. Hg. systolic and 70 mm. Hg. diastolic. Pupils responded to light and accommodation. Oral mucous membranes were dark and deeply cyanotic. There was no dullness over the lung fields and breath sounds over the chest were normal. The heart tones were of good quality and no murmurs or arrhythmia were noted. The abdomen was slightly distended and was tympanitic to percussion. The liver margin was down about 4 cm. below the costal margin and was tender to deep palpation. The extremities showed a slight edema. All the reflexes were found to be hyperactive. The Babinski was negative. Knee jerks were four plus.

Laboratory Findings.—Examination of the blood showed: hemoglobin 83 per cent (Sahli); red blood cells 4,110,000 cu. mm.; white blood cells 10,000 per cu. mm.; differential count, polymorphonuclears 87 per cent, lymphocytes 10 per cent, eosinophiles 2 per cent, basophiles 1 per cent. A subsequent white blood count on December 13 showed 13,800 cells per cu. mm. with 94 per cent polymorphonuclears. On this same date the hemoglobin was 75 per cent and the red blood cells were 3,780,000 cells per cu. mm. On the day of admission no urine could be obtained and on the specimen obtained the following day the quantity was not sufficient to determine the specific gravity. This specimen showed a 1 plus reaction for albumin and was negative for sugar; microscopic examination showed 30 to 40 pus cells per high powered field; urobilinogen was negative, bilirubin was negative and urobilin a trace. Later urine specimens on subsequent days showed a 1 to 2 plus albumin, sugar negative to a trace, pus cells 20 to 80 per high powered field and 10 to 40 red blood cells per. high powered field; also the presence of occasional granular casts was noted. The blood serum at the time of admission showed: urea nitrogen 47.5 mg. per hundred cubic centimeters; icteric index 22. Later readings showed an increase in these values which are given below.

Course.—There was an almost complete shutdown of the function of the kidneys for a period lasting several days in spite of a satisfactory intake of fluids including daily intravenous administration of 5 per cent glucose in normal saline solution. The urinary output was zero the first twenty-four hours with succeeding measured outputs per twenty-four hours of 100 c.c., 180 c.c., 145 c.c., 150 c.c., 20 c.c., 765 c.c., 650 c.c.,

775 c.c., 1,750 c.c., and 2,125 c.c. from the period December 8 to 17, inclusive. During this period the albuminuria and pyuria persisted and there was hematuria on several occasions. It was during this period that the nitrogenous waste products accumulated, as evidenced by chemical studies on the serum: non-protein nitrogen readings of 99.04 mg., 77.85 mg. and 97.17 mg. on December 11, 12 and 13, respectively; creatinine value of 3.77 mg. on December 12. Sputum typing on December 13 showed no reaction with Neufeld serums. However, chest radiograph on December 12 showed evidence of pulmonary edema. Short wave diathermy was instituted on December 12 over both lumbar areas and was continued for two days. From December 13 to 26 the output of urine increased, reaching a normal value on about December 18 or 19 and this was accompanied by marked clinical improvement. The jaundice receded, the urine became negative for albumin and there was a reduction in the number of white blood cells, red blood cells and casts in the urine specimens. The blood pressure had been elevated during the period of oliguria to 180 mm. Hg. systolic and 110 mm. Hg. diastolic, but returned to normal readings as the urinary excretion became nearer to normal in amount. Chest radiograph on December 15 showed regression of the signs of pulmonary congestion (edema). During the period of oliguria (December 6 to 16) the patient suffered from hiccough, mild convulsive seizures, restlessness, insomnia and numbness of the face, hands and extremities. During this same period he had repeated emesis and did not retain food or liquids. He received daily intravenous injections of glucose (5 to 10 per cent) in normal saline and on December 13 and 14 he was given intravenous injections of 50 per cent dextrose, 50 and 65 c.c., respectively. He received parenteral fluids until December 18, at which time he was able to eat and retain food and liquids.

The patient was ambulatory at the time of his discharge from the hospital on December 28, 1938, and has returned to his former occupation. Subsequent blood examinations have revealed no evidence of damage to the hematopoietic system.

The final clinical diagnosis was acute poisoning due to inhalation of fumes of carbon tetrachloride. On the basis of clinical symptoms and laboratory findings the clinico-pathological diagnosis was: Toxic hepatitis and acute nephrosis, secondary to poisoning by carbon tetrachloride.

Comment

1. This case report illustrates the delayed effects of inhalation of fumes of carbon tetrachloride.
2. Special attention is invited to the effects on the central nervous system, which were evidenced by hiccough, mild convulsive seizures, increased muscle tonus, hyperactive reflexes and numbness of the face and extremities.
3. Another effect observed was the prolonged bleeding time and the hemorrhagic diathesis as

manifested by the ecchymoses and bleeding into the sclera and conjunctival membranes.

4. The use of physiotherapy in the form of short wave diathermy over the kidney regions was thought to have favorably influenced the return of normal kidney function.

Report of a case of carbon tetrachloride poisoning from inhalation of fumes of a fire extinguisher is made from the personal observation of the authors.

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ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The following were among the subjects considered at the annual meeting of the Council on Pharmacy and Chemistry:

The Council voted that a special committee be appointed to consider in extenso the digitalis unit and report back to the Council. It was emphasized that digitalis, or anything that purports to be digitalis, is an official drug and must be standardized according to the methods laid down by the U. S. Pharmacopeia; that if there is a demand for another standard, that standard may appear on the label in addition to the U.S.P. standard, provided the labeling of the second standard is not misleading.

The Council's Committee on Contraceptives made a progress report concerning certain articles that have been authorized for publication.

The Council voted to adopt the pharmacopeial term "thiamine hydrochloride" to replace the term suggested by the discoverer, i.e., "thiamin chloride."

The Council authorized the Secretary's office to approach certain persons with the request that they contribute to the new series of articles on glandular physiology and therapy.

The Council discussed the present status of pneumonia therapy. It was the general consensus that there is not sufficient information yet available to determine the value of combined serum and sulfapyridine compared with adequate serum therapy alone or with adequate sulfapyridine therapy alone. The Council members felt that the practice of typing should be continued for information, both in relation to treatment and for statistical purposes. The Council also voted to accept type III rabbit antipneumococcic serum for a period of one year only. Furthermore, the Council will consider with the view to acceptance the carbohydrate material for skin testing and treatment in conjunction with antipneumococcic serums (Francis test).

The Council concluded that a statement should be prepared announcing recognition of solution of zinc insulin crystals for inclusion in New and Nonofficial Remedies. The referee was authorized to formulate a report regarding the problems relating to antiseptics, bacteriostatic agents, preservatives and disinfectants, for the consideration of the Council and, if possible, to consult with the federal authorities concerned with these questions. A progress report was made concerning the further investigation of catgut sutures.

The Council discussed the question of the increasing number of large size brochures dealing with proprietary drugs. In this form of advertising the commercial houses take on themselves the task of educating the physician in the fields to which their products pertain. It was voted that a special committee be appointed to inquire into the matter of advertising brochures and report to the Council, especially in regard to the abuses.

The Council voted to revise and rearrange the New and Nonofficial Remedies chapter on serums and vaccines. The Council authorized a review to be made of the lipid pneumonia problem, on the basis of which the Council might again consider what action to take in the case of nasal sprays in which liquid petrolatum is the vehicle.

The Council ordered that revisions be made in the permissible claims for riboflavin, nicotinic acid and pyridoxine (vitamin B₆), these alterations to be passed on by the Cooperative Committee on Vitamins with the view of later publishing a revised edition of the pamphlet entitled "The Status of Certain Questions Concerning Vitamins," and concordant revision of the statements in New and Nonofficial Remedies. The Council voted to accept the terms "pyridoxine" and "pyridoxine hydrochloride" for the substances known as vitamin B₆ and vitamin B₆ hydrochloride, provided the nomenclature met with the approval of the American Society of Biological Chemists and the American Institute of Nutrition (an official announcement of the Council on these names was published in *The Journal*, June 15, 1940, p. 2387).

The Council also discussed the term "halibut liver oil with viosterol" for a product containing halibut liver oil with viosterol and other fish liver oils. The addition of cod and other fish liver oils to a product sold under the labeled name "halibut liver oil with viosterol" will make the product subject to action under the misbranding provisions of the Federal Food, Drugs and Cosmetic Act even though the presence of the added ingredients is declared elsewhere on the label. The Council therefore voted that the present New and Nonofficial Remedies' definition for halibut liver oil with viosterol be revised to read: Halibut liver oil-N.N.R. to which has been added sufficient viosterol (activated ergosterol) to assure a potency of not less than 10,000 U.S.P. units of vitamin D per gram. (*Jour. A.M.A.*, July 139, 1940, p. 132.)

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF WINONA COUNTY

(Concluded from September issue)

Biographies

Francis J. Tourtellotte was born on December 26, 1835, in Windham County, Connecticut. He graduated from the normal school at Bridgewater, Massachusetts, then began the reading of medicine under Dr. John McGregor, of Thompson, Connecticut. He later graduated from the College of Physicians and Surgeons of New York. In 1863 he entered the medical service of the U. S. Navy, where he served as surgeon until 1868. Coming to Winona in 1869, he engaged in the business of loaning money. Dr. Keyes of Winona said of him (September, 1930) that he never practiced, but was a capitalist. Dr. Tourtellotte and his wife did much traveling during their residence in Winona.

George Townsend was listed as a Winona County physician in 1865.

J. H. Travis was a Winona County doctor about 1864.

Oscar Trenkler, M.D., came to Winona to practice in July, 1861, and at that time published the following notice:

O. TRENKLER AND CO.
German Homeopathic
Physicians and Surgeons
Office—over Orrin Smith & Co.'s Bank
Dr. O. Trenkler Dr. A. Putsch

This partnership dissolved before Dr. Trenkler's service in the Civil War. He returned to Winona and again started the practice of his profession in August, 1866.

T. S. Troyer was a Minnesota City doctor who came to practice there in 1881 or 1882.

J. Q. A. Vale came to Minnesota as early as 1857. In 1868 he was practicing at Homer. In that year he was a member of the lower house of the State Legislature, representing the 11th district. He served as town clerk of Homer in 1869 and again in 1876. Dr. Vale was a very active Republican, and in 1875 was chairman of the Republican county convention in Winona. He had served on a committee for the permanent organization of the Republican county convention in October, 1869. In that year the Winona County Medical Society was organized and Dr. Vale was one of the charter members. He was elected to membership in the Minnesota State Medical Society in 1870. In 1876 he moved to Winona in order that his children might have the advantage of the excellent schools of that city.

Aside from the practice of his profession and his political interests, Dr. Vale had an interest in a sugar mill in Homer, and owned the mill in 1881. At that time he may have returned to live at Homer.

L. Viall was a Winona doctor in 1857.

Peter Von Lackum was a botanic physician and surgeon in Winona in 1872 and remained four years or more.

H. S. Wahl, physician, settled in Minnesota City in 1884. In the same year he had graduated from the Chicago Medical College. Later he became a member of the Winona County Medical Society. Before his coming to Winona County he had been a resident of London, Canada. He became involved in domestic difficulties and left Winona under a cloud.

J. B. Walton was a physician at Homer about 1873 to 1880.

H. S. Walrath, M.D., came to Winona County from New York in 1869 and settled at Stockton as a partner of Dr. S. B. Sheardown. Dr. Sheardown was to be absent for a time and he recommended his new partner to his friends and patrons. In August of that year, Dr. Walrath married Miss Belle M. Collins, also of Stockton, who later took up the practice of medicine. In 1876 or before, he moved to Minnesota City and practiced there until September, 1882. At that time he sold his residence and office to Dr. Newberry and moved to Saint Paul. Both Dr. Walrath and his wife practiced in Saint Paul. In 1885 he was elected to membership in the State Medical Society.

Belle M. Walrath, M.D., the wife of Dr. H. S. Walrath, graduated from the Woman's Medical College in Chicago in 1882, after a two-year course. In April, 1882, her husband was accidentally poisoned, but was saved by her prompt administration of antidotes. She may have practiced in Minnesota City for a few months before their moving to Saint Paul in September, 1882. In 1883 she became a member of the Minnesota State Medical Society. At that time she was practicing medicine in Saint Paul.

H. D. L. Webster came to Winona about 1860 or 1862. His card read as follows:

Homeopathy

DR. H. D. L. WEBSTER

having added largely to his stock of medicines, will, in addition to his professional duties, furnish country practitioners and families with Homeopathic Tinctures, Triturations, and medicated pellets by the case or single bottle, in any attenuation desired. Particular attention paid to chronic Diseases, such as Dyspepsia, Scrofula, Female Complaints and Consumption.

Office—with Dr. Welch, over People's Store, Hubbard's block

Residence—In the yellow house on Third st. near J. H. Jacoby's.

Dr. Webster left Winona but returned in May, 1867, and again engaged in the practice of medicine.

Baker Webster was a doctor in Winona County in 1857.

Henry R. Wedel, M.D., graduated with distinction from the medical department of the University of Pennsylvania in the spring of 1862. He came to Winona early in that year and opened an office for the practice of medicine and surgery over Wienand and Company's drug store. He had been an assistant druggist with Wienand in 1857.

In September, 1862, he received the appointment of first assistant surgeon in the Fourth Minnesota Regiment, taking that commission in preference to an appointment of surgeon in one of the new regiments. During his term of service he became surgeon of the Fourth Regiment. He returned from service in June, 1865, and again took up the practice of his profession. Later in the same year he married Miss Anna Hibert of Winona.

In July, 1866, he associated himself with Mr. William Netter in the drug and medicine business, relinquishing his practice.

In March, 1878, he again took up the practice of medicine and surgery. During that year he became a member of the Minnesota State Medical Society, and about the same time was elected to membership in the Winona County Medical Society. He held the office of president of the latter organization in 1879. He sold his drug store in 1881, wishing to give his attention exclusively to medical practice. During his stay in Winona, he was at one time examining physician of the Saint Joseph's Benevolent Society, which was probably in connection with Saint Joseph Hospital referred to by Curtiss Wedge in his "History of Winona County" as the first adequately equipped hospital in Winona.

Dr. Wedel was an active Democrat during the seventies. He was a charter member of the Winona Council of the Order of the Royal Arcanum.

In 1883 Dr. Wedel decided to locate in Saint Paul, where he practiced for some time. He was very well liked by the Winona people, and occasionally returned for a visit.

Alfred Welch, physician, surgeon, and druggist, settled in Winona in 1856. In that year he advertised a wholesale and retail drug and prescription store. He had been for a long time connected with a large house in Philadelphia, in the sale, compounding, and dispensing of drugs and medicines. He pledged himself to sell drugs as low as they could be bought in Chicago or Cincinnati, and also advertised correct and prompt service.

Dr. Welch lived in Winona as a physician and druggist thirty years or more.

Frederick Welch was a Winona doctor in 1867. He died in New Jersey in 1883.

George Welch was a Winona physician during the seventies. He left Winona in 1878.

Charles E. Wentworth was a Winona County physician in 1864.

William A. Whippy, M.D., came to Winona in 1866 from New York State "bearing high recommendations as a practitioner." He was the partner of Dr. Pierce, and their card, published in 1866, read as follows:

HISTORY OF MEDICINE IN MINNESOTA

DRS. PIERCE—WHIPPY
Homeopathic physicians surgeons
Office in Hubbard's Block—2nd Street
Winona, Minn.

Dr. Whippy married in 1868, and lived in Winona for a time. In 1883 he and his wife and child were residents of Goshen, Indiana.

Lawrence G. Wilbertson, M.D., was born in Hornellsville, New York, on April 18, 1852. After completing his preparatory studies, he entered Cornell University, where he studied for some time. Then he taught school a year in the Lima Seminary, at Lima, New York. Early in life he had determined to be a physician, so he began reading medicine at the office of Dr. T. C. White at Rochester, New York. In 1880 he graduated from the Hahnemann College at Philadelphia, and at once came to Winona. Not long after his arrival he became a member of the Winona Academy of Homeopathy. Later he was elected to membership in the Minnesota State Homeopathic Association, and also the American Institute of Homeopathy. He supplemented his medical education by extensive reading and by study abroad in 1901-1903. He practiced in Winona for more than fifty years.

B. A. Wilder was a Winona County physician in 1864.

Adelaide Williams was a homeopathic physician in Saint Charles about 1870, or earlier. She remained there for ten years or more. In 1877, Dr. Williams was elected to membership in the State Homeopathic Institute.

J. E. Wright was a physician and surgeon in Saint Charles in 1869 or 1870.

William J. Youmans graduated from the medical department of the University of New York, taking special instruction under Professor Draper, and soon afterward went to England to pursue physiological studies in the laboratory of Professor Huxley. While there, in connection with Professor Huxley, they jointly published "The Elements of Physiology and Hygiene," the section on hygiene being Professor Youmans' work. This work was simultaneously published in England and in the United States. Returning to America, Dr. Youmans came to Winona (1869), and for about two years engaged in the practice of medicine and surgery. On the establishment of the *Popular Science Monthly* he was called to New York to assume the post of assistant editor. In June, 1871, he was the scientific editor of the *Galaxy*. He was editor of the *Scientific Monthly* for many years.

Arthur B. Young, M.D., came to Winona in July, 1876, from Minneapolis. He purchased the residence of Dr. A. B. Stuart and took up his residence in Winona as the partner of Dr. J. B. McGaughey. In the year of his arrival, Dr. Young became a member of the Winona County Medical Society. In 1875-1876 he taught in the Winona Preparatory Medical School. The date of his departure from Winona is unavailable, but in March, 1884, he was a resident of Prescott, Wisconsin.

THE MISSIONARY AS PRACTITIONER: DR. THOMAS SMITH WILLIAMSON

By ARTHUR S. HAMILTON, M.D.

MAJOR Purcell was succeeded as physician at Fort Snelling by Dr. B. F. Harney, who had as his assistant Dr. Robert C. Wood. The latter became Surgeon in 1829. During the Civil War he was appointed Assistant Surgeon General. Among the names of other medical men stationed at Fort Snelling, the following may be noted: Nathan S. Jarvis, who entered the army in 1813 from New York and died in 1862; Dr. Fitch, 1837; George F. Turner, 1843, who entered the army from Virginia in 1825 and died in 1854; Joel Martin; Adam N. McLaren, who entered the army in 1833, became post surgeon in 1849 and died in 1874; and John Emerson. These men were not particularly noted physicians. Emerson derives his chief claim to be remembered from his ownership of the Negro Dred Scott. Dr. Turner's name is of interest because of his report on an epidemic of scarlet fever at the fort, which was the first contribution to a medical periodical to be written by a Minnesota physician. As has been suggested, the first responsibility of the post surgeons was the health of the soldiers stationed at Fort Snelling. They also offered remedies and surgical services to Indians living around the fort. However, as the line of settlement, moving steadily westward, caught up with the army, and the civil population around the fort became increasingly numerous, the services of the military physicians assumed a wider significance. Not infrequently they were called on errands of mercy outside the limits of the reservation, and ministered to the needs of the residents of Saint Paul's. In this they were aided, or rather their efforts were supplemented during the decade of the forties by the work of Dr. Christopher Carli and Dr. Thomas Smith Williamson. Dr. Carli lived at Stillwater, and was the first resident physician to build up a regular practice in Minnesota. His work will be noted in further detail in another place. Dr. Williamson represents the missionary as practitioner.

Born in the year 1800 in South Carolina, Williamson lived there for only a few years; his family moved to Ohio when he was four years of age. He first chose the medical profession for his life work and after his graduation from Jefferson College in Cannonsburg, Pennsylvania, read medicine with his brother-in-law, attended a course of lectures at Cincinnati, and studied at the medical school at Yale University, completing his course there in 1824. There followed eight years of general practice at Ripley, Ohio. During that period he became interested in missionary work among the Indians of the Northwest, but hesitated to go out to the field because of the hardships that his wife and three young children would be required to endure. While the question remained still undecided in his mind, "the three little ones were gathered into the arms of their Savior." Accepting this as the will of God, Dr. Williamson at once gave up his practice, and entered Lane Theological Seminary in Cincinnati. In April, 1834, he was licensed to preach and, in the summer of the same year, he visited the Indians of the Upper Mississippi, going as far as Fort Snelling. The following year, in May, 1835, the Reverend Thomas Smith Williamson, M.D., a regular appointee of the American Board, arrived at Fort Snelling with a missionary band of five adults and three children—his wife and child, his wife's sister, Miss Sarah Poage, and Mr. and Mrs. Huggins with their two children. Mr. Huggins came to teach the Indians improved methods of agriculture.

From the time of his arrival in 1835 until his death in 1879, Dr. Williamson devoted himself unsparingly to the needs of others. For several years the scene of his labors was the mission that he established near Joseph Renville's trading

station at Lac qui Parle. During this period his chief concern was the Christianizing of the Sioux Indians. His efforts toward that end were largely evangelical and educational. Within two years he had mastered the Dakota language sufficiently to preach to the Indians in their own dialect. Soon he was engaged in the writing of hymns, the compilation of a dictionary, and the translation of the scriptures into the Dakota language. In the latter task he was assisted by Joseph Renville and Gideon Pond. In November, 1846, he moved with his family to Little Crow's village, seven miles below Saint Paul, where for six years he ministered to the needs of his white neighbors as well as of the Indians. After the Treaty of Traverse des Sioux in 1851 he followed the Indians to their new reservation at Yellow Medicine in the western part of the present state. There he continued to work until the Indian massacre of 1862. In later years he served as a member of the Board of Visitors to the Chippewa Indians in the vicinity of Cass, Leech and Winnibigoshish lakes. The years preceding his death were spent in St. Peter.

Although he was primarily interested in spreading the gospel, the medical work that Dr. Williamson did among the Indians assures him of his place in the present volume. He carried on an active practice, and established a medical mission years before such units were recognized by missionary boards. Possibly this activity had much to do with the wave of unpopularity which manifested itself eight or nine years after his coming to the post at Lac qui Parle.† The Indians did not want the white man's religion and were frankly suspicious of his motives for coming amongst them, but they were not, at first, aggressively opposed to the missionaries, and it was possible, by means of a feast, for example, to bring together a fair congregation, even of men. As time went on, however, the Indian medicine men began to see that the white men's medicine was superior to theirs and that their power would necessarily decline. Then began an organized opposition to the white man. A failure in crops and other misfortunes were charged to the missionaries. Then the mission oxen began to disappear, then the horses, and finally the family cow was all that was left to haul the firewood. The Indians were directed to remain away from the church, school, and mission house, and those who disobeyed the injunction were subjected to various petty persecutions. These were the conditions that induced Dr. Williamson to remove to Kaposia.

While living at Kaposia, the missionary doctor assumed the duties of Dr. Turner at the fort during the latter's absence from the garrison. An account book has been preserved which carries the following items of interest, dated 1843:

"For attending on the Garrison and Indians for Dr. Turner, three months and eight days, \$229.00. For private practice while living near Fort Snelling, \$110.06."

The items do not show whether he was paid by Dr. Turner or by the government. The six cents must have come in some way through the price charged for drugs. In his private practice he was moderate in his charges, and seldom received money in payment. Usually he received his compensation in beef, potatoes, and grain.

Dr. Williamson's long period of service among the Sioux Indians enabled him to study their diseases, and their medical practices much more closely than was ordinarily possible for a white man. He improved his opportunities, and in later years wrote several papers which have their place in the literature of Minnesota

†*"A Brother to the Sioux,"* by Winifred W. Barton, p. 22.

medicine. Two of these articles have been selected to be reprinted in the present volume. The first, entitled "Diseases of the Dakota Indians," first appeared in the *Northwestern Medical and Surgical Journal*, 4:411, 1873-74. The second, on "Dakota Medicine," is reproduced from Stephen R. Riggs, *Tah-Koo Wah-Kan; or, The Gospel Among the Dakotas*, 1869, page 435.

DISEASES OF THE DAKOTA INDIANS*

By THOMAS S. WILLIAMSON, M.D.

MY acquaintance with the Indians of Minnesota dates from the time of my arrival with my family at Fort Snelling, May 16, 1835. After residing there a little more than a month, I proceeded to Lac qui Parle, where I arrived on the 9th of July; and made my home there from that time until November, 1846; though in that time I was absent two winters, and most years at least one month in summer, getting supplies for my family.

There were about 400 Indians estimated as residing there at the time of my arrival, though a large portion, considerably more than half, were absent a month or two every fall and spring, and sometimes most of the winter; but in the winter the places of the absentees were more than filled by the aged, diseased and infirm from other villages, who were brought and left there by their relatives, who could not carry them along in their wanderings in search of food or furs in winter; and trusted to the hospitality of the residents to keep them from starving in their absence.

I had practiced medicine ten years in Southern Ohio, Adams and Brown Counties, had become familiar with the malarious paludal diseases; at that time very prevalent in those localities, and I here used my knowledge of medicine as a means of getting a hearing for that which I came to teach.

Though the medicine men bitterly opposed me because I refused to give medicine to those over whom they performed their incantations, and by my success deprived them of half their fees, I was called to see nearly every fatal case of disease which occurred among the Indians residing there; many also came, or were brought to me from other villages to get medicine, and for the last ten years of my residence there I heard of nearly all the deaths occurring in a population of about 1,000. It was not possible, however, to get such statistics as you ask for. The Government at one time asked for a census of the population there, and the traders and myself attempted to take it, but as soon as this was known by the principal men they positively forbade our completing it, and any attempt to proceed would have endangered our lives, for the reason that *their* lives would be endangered, they thought, by any such step.

About the time of leaving I remember having made an estimate that fully one-half of the deaths among the Indians with whom I was acquainted while there were violent deaths. Eleven were killed at one time by the Chippewas, and almost every year one or two were killed; there was, I suppose an average of one or two murders a year from drunkenness, jealousy, envy, et cetera, and also one or two suicides during the time.

Of those over ten years old who died of disease, I think fully half died of con-

*Published in *Northwestern Medical and Surgical Journal*, Vol. iv, July, 1873-June, 1874, inclusive, p. 411.

sumption (phthisis pulmonalis), nor does this seem strange to me as from your letter it appears to you; for I do not think it was much more prevalent among the Indians than among our white population; while from the fact that they were all tainted with scrofula, their mode of life, et cetera, it might be expected that it would be very much more so.

Notwithstanding the many deaths from violence while I was at Lac qui Parle the number of births very much exceeded the number of deaths. The great proportion of phthisis was chiefly owing to so few dying of other diseases. I had lived among the Indians above twenty years before I ever saw one of them suffering from typhus or typhoid fever. Smallpox was in the country several times and was very fatal among the Indians on the Missouri and at Winona, but only one death occurred from it among the Indians at Lac qui Parle; and perhaps not more than a dozen among all the Indians on the Minnesota River, as they were generally protected by vaccination.

The measles, in an aggravated form, prevailed among the Indians once while I was there, and a number of them, several far advanced in years, died from it and the dysentery, which generally accompanies or follows it among Indians.

The above are all the cases of death from what are called zymotic diseases. I do not remember of ever having seen a well marked case of scarlatina among the Indians. There were some severe cases of sore throat, but none fatal of which I remember to have seen or known. From their phlegmatic temperament they are less subject to nervous diseases than whites, yet I have seen a number of severe cases of spasms among them, none of which, however, proved fatal, if I remember correctly. I recall one case of cancer, and only one. It was on the top of the foot, and fatal after four or five years. Several killed themselves by overeating, but I was not called to see them. As at that time they used little or no salt with their food, which was for the most part poor in quality, and often scant in quantity, plethora and the many inflammations which originate therefrom were unknown among them.

I remember of one old conjurer who died of pneumonia, brought on by exposing himself naked for hours out of doors to a chilly wind in October when it was alternately spitting snow and drizzling rain, performing religious rites to secure the assistance of their gods in favor of a war party against the Ojibways.

There were some several cases of suffering from disorders of the urinary organs, but none that came to my knowledge at Lac qui Parle proved fatal. Children often suffered severely from teething and owing to lack of suitable food. In such cases, some of them died from diarrhea or dysentery, and others from hydrocephalus; but not a greater proportion than among our white population. But among the women and children who remained in the neighborhood during the winter, scrofula was almost universal; caused by their subsisting entirely on corn, for weeks, and some years for months. Enormous swellings formed about their necks and armpits, and occasionally on other parts of the body, forming abscesses which sometimes so exhausted the system as to prove directly fatal, but more frequently by inducing phthisis or mesenteric diarrhea. In the spring when the ducks returned so that they could get animal food most of them got better and some entirely recovered.

(To be continued in November issue)

President's Letter

MEDICAL TESTIMONY

FOR a long time both our Medical Association and the Bar Association have felt that changes in court procedure in cases requiring expert medical testimony were needed. One of the chief reasons cited being the frequency in which medical testimony is biased in favor of the side employing the medical witness; this happens so often that it is hard for the Court to obtain impartial information. Another criticism is that of perjured testimony by the physician; this in turn at least implies a dishonest attorney. Another objection is testimony that is garbled and inconclusive, given by physicians who are not qualified by experience or training to act as experts.

Expert medical testimony should be intelligent, scientific, and dependable. Any physician chosen as an expert witness should by special training and broad experience be qualified to give reliable authoritative information. We realize that consultants often differ and the best of men may have honest differences of opinion; but too often these experts give opinions and draw conclusions so diametrically opposed and so conflicting that bias and partisanship are self-evident, and the expert testimony thus becomes worthless to the Court and jury.

Both the State Bar Association and the State Medical Association are agreed that improvements in court procedures involving medical testimony can and should be made. A number of changes have been suggested, some of which sound plausible. It would seem sensible that the testimony of the attending physician should be limited to the condition of his patient, the progress of the case, and the results obtained; he should have a definite idea as to the amount of recovery made, and be able to justify his opinion. But he should not be called upon as an expert witness. Various plans have been suggested for choosing expert medical witnesses: One plan is for the plaintiff and defendant each to choose a physician, and the court to choose a third to act as referee. Another suggestion is to have the County Medical Society choose the expert medical witnesses. Legislation will be required to make any such changes, however, and this will be difficult, requiring a long period of time.

In an endeavor to start some improvements in medical testimony, a new committee of our State Medical Society has been formed. Recently, and without our knowledge, the Minnesota State Bar Association also appointed a committee to work on the same problem. On July 11, 1940, during the annual meeting of the State Bar Association, we had the privilege of meeting with that committee. Among those present was Justice Royal A. Stone of the Supreme Court of Minnesota. Justice Stone is chairman of the Judicial Council created by the Minnesota Legislature in 1937, to make a "continuous study of the organization, rules and methods of procedure and practice of the judicial system of the state, and of all matters relating to the administration of said system and its several departments." Justice Stone told us it was his firm belief that when the various courts of the State are informed of the creation of our committee, we shall receive the enthusiastic support and cooperation of the courts in dealing with flagrant violators in the medical profession in matters concerning medical testimony. Reprimanding a few physicians should be an effective deterrent to such practices; more serious cases, and those involving perjury can be referred to the Minnesota State Board of Medical Examiners for action leading to suspension, or revocation of the license of the physician involved. This may seem like drastic action, but we cannot afford to allow the dishonesty of a few to continue to bring reproach on our profession. Our code of ethics not only does not condone such practices, but it is strongly opposed to them, and the courts of justice certainly cannot, and will not, uphold such violations of trust and honesty. This kind of misconduct must be stopped and it is the duty of every self-respecting physician to see that it is stopped.

B. S. ADAMS, M.D., President
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

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NEW PLAN ADOPTED TO CONTROL MEDICAL TESTIMONY

A new plan for control of dishonest medical
testimony, source of scandal for many
years, both to the medical profession and the
public, was officially adopted by the Council
of the Minnesota State Medical Association
at its regular fall meeting held Sunday, Sep-
tember 22, at the St. Paul Hotel.

This plan is the result of several confer-
ences between a special committee appointed
to study the question by President B. S. Ad-
ams of Hibbing and representatives of the
Minnesota State Bar Association, who have
also interested themselves in the problem.
The conferees had the benefit, also, of advice
from Justice Royal A. Stone of the Supreme

Court of Minnesota, who is himself Chairman
of a Judicial Council appointed by the Min-
nesota State Legislature in 1937 to study
rules and regulations and procedures of the
judicial system of the state.

No change in legislation is contemplated in
the plan submitted by Chairman E. M. Ham-
mes of St. Paul and approved by the Council.
Instead, a permanent Committee on Medi-
cal Testimony of the Minnesota State Med-
ical Association will be formed. Services of
this Committee will be put at the disposal of
any judge in the state who has reason to be-
lieve that medical testimony in any case de-
cided in his court has deliberately deviated
from the truth.

Judges will be invited to submit such cases
to the Committee for investigation and study.
If, upon close investigation, it appears to the
Committee that the testimony of the physi-
cian was indeed dishonest, the case will be
turned over, together with all findings, to the
State Board of Medical Examiners for disci-
plinary action.

Offenders who are thus reported to the
State Board will be subject to censure and
warning or to suspension or revocation of
their license to practice medicine, according to
the judgment of the Board.

The seriousness of the problem of dishonest
expert testimony has been recognized by rep-
resentatives of organized medicine for many
years. Many proposals have emanated both
from physicians and lawyers for changes in
the law which would eliminate entirely the
hiring by litigants of medical experts. Legal
authorities who conferred with the Commit-
tee on the new plan of attack did not, how-
ever, favor any movement to change the law
at the present time. All of them felt that
the existence of the new Committee would,
if its functions and objectives were well
known, achieve a great deal to control the
situation in Minnesota.

The importance of the new Committee and
its work was therefore emphasized by the
Council and instructions were issued to inform

every judge on the Minnesota bench of its existence and its availability for investigation of suspicious cases.

"Honest differences of opinion exist, of course," Dr. Hammes pointed out in his report. "Every allowance should be made for such differences wherever the point at issue admits of honest disagreement on the part of medical witnesses called.

"The plan is not designed to eliminate differences of opinion but to control the occasional 'shyster' physician who, like the 'shyster' lawyer, makes a farce out of justice and casts discredit upon his entire profession.

President Adams immediately appointed the members of the temporary committee who studied the question with the Bar Association, to the permanent committee. They are:

Dr. E. M. Hammes, St. Paul, *Chairman*
 Dr. H. B. Annis, Minneapolis
 Dr. L. A. Barney, Duluth
 Dr. J. F. Norman, Crookston
 Dr. W. G. Workman, Tracy.

A similar committee is being appointed by the Minnesota State Bar Association and plans are already under way for an early meeting of the two committees.

In the meantime, immediate steps will be taken by order of the Council to apprise all Minnesota judges, members of the Bar Association, and physicians of this action.

STATE LICENSURE OF LABORATORY TECHNICIANS

OLDER physicians may recall the days, not so long ago, when clinical laboratory service consisted mainly of simple routine procedures which any young woman of average intelligence could easily learn and carry out. No essential educational background or systematic instruction and training was deemed necessary to qualify her for the task. At best, her training embraced a short period of apprenticeship. Known as laboratory technician, she was able to adequately meet the needs of her days and was often considered competent or even indispensable.

However, with the rapidly widening scope and increasing complexity of the present day practice of laboratory medicine which intimately evolves

around the practical application of the principles of all fundamental sciences, it had become increasingly apparent that the laboratory technician of those days with her limited preparation could no longer satisfy the demand of the modern clinical laboratory.

In order, therefore, to adequately insure the aid of properly trained technical workers and thus safeguard the practice of clinical pathology, the American Society of Clinical Pathologists, in 1928, created a Board of Registry of Medical Technologists whose function was to clearly define the qualifications of laboratory workers and to issue certificates of registration to those who came within that definition, and voluntarily submit to the examination. The present requirement consists of two years at least of college work with the necessary credits in chemistry, biology and bacteriology and a year of practical instruction and training in a clinical laboratory approved for such training by the American Medical Association and the American Society of Clinical Pathologists.

The American Medical Association, the American College of Surgeons and other medical organizations have wholeheartedly endorsed the Registry's program and encouraged all approved hospitals to employ registered medical technologists in their clinical laboratories in preference to those who do not possess the minimum qualifications required by the Registry.

In the past decade, the services of the qualified medical technologist have become increasingly indispensable to the practice of clinical pathology. She has gradually supplanted the old time laboratory technician of yesterday.

Thus, in the twelve years that have elapsed since the establishment of the Registry and solely through its efforts, the laboratory worker has been transformed from a non-descript lay-helper to a scientifically trained professional who plays an important rôle in every day practice of medicine. This has clearly demonstrated not only the wisdom of the American Society of Clinical Pathologists in having initiated the system of voluntary registration of qualified laboratory workers but also the value, professionally and economically, of such registration to the registrants themselves.

Today, the Registry of Medical Technologists of the American Society of Clinical Pathologists, with its six thousand registered members, is an

established institution of national importance enjoying the confidence and support of representative medical organizations.

Unfortunately, there are a large number of laboratory workers who by reason of their inadequate education and training are unable to qualify for registration. These and other disgruntled elements are making organized effort to discredit the work of the Registry, whose alleged "dictation" they resent, by banding themselves together, ostensibly for the purpose of obtaining state legislation to license all laboratory workers in every state in the Union but actually to nullify the already well established nation-wide voluntary system of registration sponsored by the Registry.

The American Society of Clinical Pathologists, after careful investigation, has come to the conclusion that the present system of universal voluntary registration of qualified laboratory workers by a responsible national agency, no matter who may conduct it, is more effective in maintaining their scientific and ethical standards than any method of individual state licensing.

Such a law, if enacted, will inevitably lead to several undesirable consequences. The chief among these, which vitally concerns the practice of clinical pathology, would be the lowering of the standard of qualifications of the eligibles in order to allow the advocates of this legislation to qualify, the majority of whom can not meet the minimum requirements of the Registry. This would naturally bring down their professional standard, which in turn would defeat the very objective of the proponents of the legislation, namely, to bring about a better economic status for the average laboratory worker.

Another undesirable feature of legal licensing would be the substitution of the present universal voluntary system with its twelve-year record of successful operation, by untried, compulsory state laws necessitating forty-eight or more separate and unequal standards of qualifications and regulations which would be the source of unending confusion. On this point, Doctor W. D. Cutter, Secretary of the Council on Medical Education and Hospitals of the American Medical Association, made the following statement: "It was determined that the Council was in no position to feel that a state board of examiners in medical technology would represent any advance over present methods of control in this field. The ex-

perience of the Council in the licensure of physicians and the registration of nurses have indicated that statutory control in each of the forty-eight states would in the end be less effective than a central voluntary registration system."

There is also a possible danger of which the practicing clinical pathologist is apprehensive in the event a law of this kind is enacted, namely, a danger of permitting licensed laboratory technicians to feel capable of engaging in the practice of clinical pathology by operating or "taking charge" of a clinical laboratory without the supervision of a licensed physician.

There are a few among the laboratory workers in Minnesota, some well meaning, who apparently believe that their economic independence and well-being rests largely upon recognition by the state through compulsory licensing. By their desire to attain this goal they are apparently willing to sacrifice their professional standards. This is clearly evidenced by their readiness to join hands with the national group whose membership is composed of non-registered technicians including the so-called "graduates" of unapproved schools and others ineligible to register. This group, incidentally, is intimately identified with the American Medical Technologists, an organization composed of non-registered laboratory technicians recently formed by a male technician who conceived the idea of issuing certificates of registration to those who join it by paying a fee of \$5.00, which entitles the holders to identify themselves as medical technologists and suffix the letters M. T. to their names, making it impossible to differentiate them from the bona fide Registered Medical Technologists, certified by the American Society of Clinical Pathologists, the intent clearly being to confuse the minds of the medical public and embarrass the legitimate work of the Registry, the official agency of the organized clinical pathologists. (See Editorial Comment, *Jour. Am. Med. Assn.*, 114:1269, March 30, 1940.)

These facts are briefly outlined at this time so that physicians of Minnesota may be correctly informed of the movement, now being agitated by a certain group of laboratory technicians toward legislative enactment of a law governing the status of laboratory workers which the American Society of Clinical Pathologists as well as the American Medical Association considers ill-advised and unnecessary in view of the effective work which the Registry of Medical Technol-

ogists is carrying on for the maintenance of scientific and ethical standards of qualified medical technologists.

KANO IKEDA, M.D.

Miller Hospital
Saint Paul

WILLKIE AGAINST SOCIALIZED MEDICINE

THE *Rocky Mountain Medical Journal* for September, 1940, printed the following letter, addressed to Dr. T. Leon Howard, Denver, Colorado, under date of August 7, 1940:

"My Dear Doctor:

You have asked my views on socialized medicine. I am against it. You can quote me any place on this.

Cordially yours,

WENDELL L. WILLKIE

Concise and to the point. He is opposed to socialized medicine. His reply contains no "ifs,"

If elected there will be no more interdepartmental committees appointed by the president and composed of socialistically minded government employees who formulate, with only contempt for the opinion of the medical profession, bills for Wagner to submit to Congress. If elected, no more of Thurman Arnold and his suit of the medical profession for its alleged constraint of trade.

What a relief this would be.

C. B. D.

SUGGESTED POLICIES AND PHYSICIANS' RECOMMENDATIONS FOR PUBLIC HEALTH NURSING SERVICES

(Revised 1940)

EDITOR'S NOTE: The above regulations have been revised by the Public Health Nursing Committee of the Minnesota State Medical Association and have been approved by the Council of the State Medical Association and the State Board of Health. They are published here in full to serve as a guide for counties that may have occasion to employ health nurses.

General Policies

It is highly important that public health nursing practices be consistent with the medical consensus of the community, and for this reason it is suggested that each county medical society approve certain policies involving nursing procedures and instructions for the guidance of public health nursing.

1. Any agency employing public health nurses should have its program approved by the physicians in the community.

2. The nurse shall emphasize the importance of medical care but shall not recommend *the selection of any individual physician*. She shall not give nursing care after the first visit except under the direction of a licensed physician. Records of nursing care shall be kept on file by the nurse. In special cases of economic need the nurse shall use the facilities provided by public and private agencies in coöperation with the family physician.

3. *The nurse does not diagnose nor prescribe treatment*. It is her function to follow the instructions of a physician. Public health nurses working under the direction of local physicians may be allowed to give and read various diagnostic tests, provided approval has been given by the physicians in the community.

4. The nurse shall make a written report to the physician or agency whose patient she has contacted. Such report may be given to the patient to take to the physician, or may be delivered directly to the physician. Carbon copies should be kept on file—a standard blank form is suggested in the Nurses' Manual, supplied by the Minnesota Department of Health.

5. The establishment of clinics or other health activities which involve medical service shall be undertaken only upon the approval of the county or district medical society.

6. Every public health nurse shall understand and support the state health laws and regulations and shall keep in direct contact with the local and state health departments.

7. Every nurse engaged in public health nursing should be approved by the Committee on Certification, for which provision has been made in the Minnesota State Health Laws and Regulations, Section 5353-4, PP. 26.

8. The work of every nursing service shall be carefully and consistently recorded. The nurse shall in addition to such reports as may be requested by the local agency make written reports through the board employing her to the state and local boards of health in such form and at such times as shall be prescribed by the State Board of Health.

9. It is suggested that all public health nurses at the time of employment, and periodically as requested by the employing agency or the State Board of Health, present a satisfactory personal health record that includes recent smallpox vaccination, evidence of immunity to diphtheria, and freedom from active tuberculosis as determined by tuberculin tests and/or x-ray and other procedures as indicated.

Physicians' Recommendations

The following recommendations are submitted to physicians for their approval, to be used as a guide to the nurse in her administration of nursing care, treatment and medication in those emergencies where no physician is in attendance, when orders have not been left by the attending physicians, or when the nurse has been unable to reach the physician for orders. In cases which will probably not require the services of a physi-

cian, the first aid treatment administered by the nurse should comply with that accepted as standard procedure by the American Red Cross.

Such recommendations should cover the general educational content of the nurse's teaching, as well as the procedures which she may perform. Physician's standing orders to nurses are concerned with:

- (1) Teaching content of health education in the home and school as regards the health and environmental sanitation of the family.
- (2) Nursing care of sick persons under or pending medical direction.
- (3) The health of school children through the nurses' part in the school health program.

Emergencies and Accidents.—Only first aid should be given. In the event of a severe accident, immediate medical care should be secured by calling the nearest physician or hospital, if it is impossible to locate the family physician of the injured person. If the patient is a minor, communicate with parent or guardian immediately.

All nurses are expected to be familiar with the standard technique adopted by the American Red Cross for the first aid treatment of accidents or injuries, and in caring for such conditions before the arrival of the physician she will limit herself to these accepted procedures.

Communicable Disease Control.—If communicable disease is suspected the nurse should explain to the family the elementary principles of isolation, concurrent and terminal disinfection, and such other measures which will aid in preventing the spread of the disease in question. (See "Home Isolation Procedures" Manual for Public Health Nurses.)

If the patient is attending a school, the school officials should be notified in writing in order that those who have had contact with him may be properly observed and the health officers of the sanitary districts in which the school is located and in which the child resides should be notified of the occurrence of suspected communicable disease as provided by Regulation 318 of the Minnesota State Health Laws and Regulations.

In the presence of suspected communicable disease the nurse is expected to make the patient as comfortable as possible, isolated from all other persons. Any of the following symptoms shall be considered sufficient reason for such isolation:

Fever 100° or more
Sore throat
Coryza
Vomiting
Rash
Inflamed eyelids
Running ears
Skin lesions, suggesting scabies or impetigo
Pediculosis

In aiding physicians in the control of preventable diseases public health nurses are expected to cooperate with the local health officer and to follow the Regulations of the State Board of Health as outlined in Chapter 6 of the Minnesota State Health Laws and

Regulations as issued by the Minnesota State Board of Health, 1938.

Immunizations.—The nurse should teach families that smallpox vaccination and diphtheria immunization should be done as early as possible, preferably before the end of the first year.

The administration of vaccines and other biologic products for the prevention of certain communicable diseases is the responsibility of the physician. Group immunization programs should be conducted under the auspices of a local medical society who may secure available biologics from the Minnesota Department of Health. The nurse's contribution to such programs involves preliminary education of the community, making the necessary arrangements for carrying through the programs, assisting the physicians when the immunizations are being performed, summarizing reports, and keeping local records of immunizations given.

Syphilis and Gonorrhea.—"Reg. 2512. All persons infected with a venereal disease shall continue under treatment or proper observation until no longer able to transmit the infection. In the case of gonorrhea this shall be until all clinical and microscopic evidence is negative.

"In the case of syphilis this shall be until all clinical and laboratory evidence is negative and sufficient treatment to reasonably insure a cure has been taken."

As problems in relation to syphilis and gonorrhea are encountered or brought to the attention of public health nurses, all available information regarding these problems should be referred to the Division of Preventable Diseases, Minnesota Department of Health, for consultation and advice regarding future responsibility of the nurse. Where cases are known to be under medical care, problems relating to them should first be discussed with the attending physician.

Any follow-up work done by public health nurses on cases brought to their attention should be reported to the Division of Preventable Diseases on a special form (L.N.G.) supplied for that purpose.

Public health nurses should always bear in mind that information relating to venereal disease should be kept confidential. See Regulation 2510, P. 63, Minnesota State Health Laws and Regulations.

Tuberculosis.—Infectious and potentially infectious cases (active or with tubercle bacilli in sputum) should be isolated preferably at a sanatorium following the diagnosis and recommendation of the attending physician or health officer. Such cases while awaiting admission to the sanatorium should be completely isolated at home. (See communicable disease isolation procedure in Public Health Nursing Manual supplied by the Minnesota Department of Health.) Special attention should be given to adequate terminal disinfection after patient has left the household. Hospitalization may also be advised for other forms of tuberculosis.

Medical examinations, including tuberculin tests and x-ray films, if necessary, should be urged for all other

members of the family and other close contacts.

Maternity and Child Health.—The public health nurse's work with mothers and infants should constitute an important part of the program. Group classwork offers a convenient medium for reaching large numbers of mothers and creating a general understanding of good habits of maternal, infant and child care. The nurse should discriminately distribute educational literature available from the Division of Child Hygiene, Minnesota Department of Health, and stimulate effective use through explanation and demonstration of the information. The public health nurse will find it desirable to secure standing orders from individual physicians for treatments and nursing procedures to be carried out for their patients.

In working with *expectant mothers* the aim should be to bring the patient under early and continuous medical care, to teach the elements of prenatal hygiene, and to carry out nursing care or treatments ordered by her physician. The nurse should help the mother plan for delivery and reception of the new baby. These preparations, and particularly the making of sterile supplies, are important when home delivery is planned.

For *obstetrical patients* nursing care may be given to mother and newborn infant. Every nurse should be concerned with the prophylactic protection of the infant's eyes and the registration of birth as required by state law. In the event of postpartum hemorrhage send for the physician at once, massage uterus against secum, elevate the foot of the bed, and keep patient quiet and warm.

Nursing care, such as bed bath and perineal cleansing, may be given to *postpartum patients*, as well as any treatment ordered by the physician. The nurse should emphasize the value of rest during the involution period and other aspects of hygiene, the value of the postpartum medical checkup, and teach the value of breast feeding.

Infants and preschool children should be visited to give instruction on diet, general hygiene, and immunizations. For the *premature* infant being cared for in the home, the field nurse can be of considerable assistance in making arrangements for maintaining the body temperature, feeding, isolation of the infant, and the giving of nursing care. The birth of a premature infant may create an emergency and obviously the best results will be obtained where the nurse is prepared and coöperating with the physician under a definitely prearranged program.

School Health.—Public health nurses in school health work are under the immediate direction of the school administration. It is recommended that a school health council be appointed with medical and dental representation to help guide the policies of the service, especially as they apply to medical and dental relationships. School nurses coöperate with physicians and dentists to improve the health of school children by means of

health education directed toward children and their parents and by consultation with parents on problems of child health and environmental sanitation.

The school nurse aids in controlling the spread of communicable disease by helping teachers recognize suspicious symptoms in children and recommending immediate separation from other children and exclusion from school until proper authorities have readmitted them.

"Reg. 318. All . . . pupils shall be reported to the school physician for medical examination unless in the opinion of the head of the school the pupil's condition requires that he or she be sent home immediately or as soon as a safe and proper conveyance can be found.

"In such cases the pupil shall be sent home and the health officer of the sanitary district concerned shall be notified immediately by the head of the school.

"In the districts where there is but one teacher for a school and in schools where there is no school physician or in the absence of the regular school physician it shall be the duty of the teacher or head of the school to exclude from school all pupils, who, in his opinion or that of the school nurse" appear to be ill or show signs of a communicable disease "and to report same to the board of health of the sanitary district in which the school is located and to the board of health of the sanitary district in which the pupil lives. The teacher shall continue to exclude such pupils until a properly signed certificate is presented from the health officer in each case.

"(Note.—A school nurse may perform the duties outlined, under the supervision of the health officer when there is no school physician.)"

GOVERNMENT TO NEED TEMPORARY AND PART-TIME CIVILIAN MEDICAL OFFICERS

The expansion of the Army creates a need for about 600 civilian medical officers in various grades for temporary and part-time service. The duties of full-time officers will be to act as doctors of medicine in active practice in hospitals, in dispensaries, and in the field. The duty of part-time officers will be to report for sick call at a fixed hour each day and to be subject to emergency call at all times.

The Civil Service Commission in making this announcement calls particular attention to the fact that part-time officers will be able to continue their regular practice. In order that this may be done, appointments to the part-time positions will be made of medical officers in the vicinity of the place of duty.

Information concerning these positions may be obtained from the Secretary of the Board of U. S. Civil Service Examiners at any first- or second-class post office, or from the United States Civil Service Commission, Washington, D. C. Physicians are urged to apply at once. This work is of the greatest importance to the success of the National Defense program.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

THE COUNCIL MEETS

Doctor and Defense

Medical problems of national defense chiefly occupied the Council at their fall meeting held Sunday, September 22, at the St. Paul Hotel.

Are a sufficient number of physicians available to take care of military needs and also to serve the civilian population?

What will be done with culls who are eliminated by the draft boards for physical defects?

What is to be done if blood tests for venereal disease and treatment of enrollees showing positive Wassermanns are required?

Will physicians be compensated for their work as draft board examiners?

What can the medical profession do to oppose demands for state medicine that will inevitably be made on a basis of total defense for the nation?

Answers Sought

Answers to these and many other questions are being sought by officials in charge of medical participation in national preparedness. In the nature of things they cannot all be answered now; but the following pertinent information was presented to the Council by Dr. A. J. Chesley, Secretary of the State Board of Health and Dr. H. S. Diehl, Dean of Medical Sciences at the University of Minnesota, both of whom have just returned from military conferences:

Must Give Preference

Dr. Chesley: The time factor in our preparedness is crucial. We are late, as always, and we can only hope that an act of God will save us this time as it did before. The problem that faces us today is the most important that ever faced the United States and the

medical profession and we must give preference to military preparedness before everything else in our program.

"Serious Situation"

"The majority of our trained personnel in the State Board of Health are in the Reserve or National Guard. We face a serious situation within the Department and outside the Department in all the health and sanitary departments in the state since, not only training but familiarity with local sanitary problems are essential to the smooth running of our services. The possibility of depleted personnel for these services must be faced.

"If all of the medical service suggested in some quarters for draftees is given, furthermore, it will require more physicians than there are in the United States to deliver it. For instance, if blood tests for venereal disease should be required as suggested for each man, the need for laboratory service and for competent medical service to interpret findings and undertake treatment would be immense.

Is Test Essential

"We will do what is required of us in Minnesota if we can; but it is a question if the venereal disease problem needs to be tackled on this scale. In the Army games and maneuvers in Wisconsin, for instance, it was discovered that venereal disease among the guard regiments encamped was about one-hundredth of what it is in the regular army.

"Is it essential, on that basis, that every man drafted be tested for venereal disease? And if he is, how is treatment to be given to those found infected? What is to be done about those who are found unfit, for other reasons, for service? Some solution to that problem will be demanded and the medical profession must be ready for it or—possibly—see

state medicine moving in unchallenged behind the draft."

Student Service

Dr. Diehl: As you know, all student service has been deferred for a year. First year internes will not be called and the probability is that all medical students will be allowed to complete their medical training or that student army training corps will be established at the schools.

8,000 Needed

"It is estimated that about 8,000 doctors will be needed out of the Reserve immediately this next year. About 11,000 are available in the National Guard and in the Reserve, and no more enlistments are accepted now in either, though negotiations are underway to reopen enlistment to medical men in the Guard.

"Those who are drafted and who are not in either the Reserve or the Guard will enter the service as regular enlisted men but will undoubtedly be transferred into the Medical Corps as soon as possible.

"No Compensation for Examiners"

"This is undoubtedly a long-time preparedness program and the probability is that essential teaching members of medical school staffs will not be assigned to military duty.

"It was assumed at the start that pay for medical examiners would follow the regulations of 1917. According to present plans, however, there will be no compensation for these examiners though discussions on this matter have not yet been concluded and the decision may not yet be final."

It was suggested that information brought to the Council by Dr. Chesley and Dr. Diehl, particularly problems which may involve government medical services to rejected enrollees, be submitted to the Committee on Medical Economics for study and discussion.

PREPAREDNESS CONFERENCE

A conference of great importance to national medical defense was held last week in the Headquarters Building of the American Medical Association in Chicago. Taking part in this Conference were Chairmen of the State Committees on Medical Preparedness, members of the National Committee on Medical Preparedness, rep-

resentatives of the Army and Navy and the United States Public Health Service, members of the Board of Trustees and officers of the American Medical Association.

One could not avoid being impressed with the enthusiasm and unselfish spirit of intelligent cooperation manifested by all of those assembled. The progress in medical preparedness made by the united efforts of the profession under the guidance of the American Medical Association, in cooperation with the Federal Bureaus, was most reassuring and should answer those who are skeptical regarding a democratic form of government. If all other activities were developing as rapidly as that of medical preparedness, national defense would be much farther advanced.

Main Objective

The officers of the American Medical Association are at present making the matter of medical preparedness their main objective. It is a prodigious task to assemble data concerning more than 160,000 physicians in the United States and to make such data available for practical purposes. Already more than 100,000 information cards have been turned in by physicians and it is the hope of the Bureau that the return will be 100 per cent. In order to carry on this great task the Bureau of Medical Economics, under the capable leadership of Dr. Leland, has greatly augmented its staff and is devoting its entire time to this purpose. Other problems affecting medical economics will, for the present, have to await the completion of this most important task.

Pamphlet Will Be Prepared

As previously announced, preparations are being made by Dr. Fishbein to publish a pamphlet, beginning the first of the year, which will be devoted to news and developments affecting military medicine. This will make available the rapid transmission and co-ordination of recent developments in all fields of medicine.

Efforts Hampered

Many officers of the American Medical Association find themselves in a rather anomalous situation in that in spite of their unselfish and able coöperation in defense of their country, they soon will be hailed into court in Washington, D. C. to defend themselves against the charge of conspiring to violate the federal laws of trade. It will be necessary for many of the officials of the A.M.A. to move to Washington and establish temporary headquarters there for an

indefinite period of time, since they will be held liable to summons any time after October 21. This will naturally hamper their efforts to carry on in the interest of medical preparedness.

way to more extensive federal methods of examination and therapy.

W. F. B.

Medical Committee Appointed

It is of interest that the national coöperating Committee on Medical Defense has finally been appointed by President Roosevelt. This includes the Surgeon Generals of the Army, Navy and United States Public Health Services, Dr. Weed, representing the Council on Medical Research, and Dr. Irvin Abell, representing the A.M.A. as Chairman. Apparently considerable controversy arose in inner governmental circles as to the advisability of appointing Dr. Abell; but the matter was finally decided in his favor. He holds the unique position of being Chairman of the Committee on Medical Preparedness which was appointed by the House of Delegates of the A.M.A., Chairman of the Board of Regents of the American College of Surgeons, and, as Past President, is a direct representative of the American Medical Association. American medicine is indeed fortunate to have a representative so able, not alone in his profession but in an executive capacity and as a diplomat, to represent its cause. He enjoys the confidence not only of his colleagues, but of the officers of the various federal health activities and other governmental leaders. Needless to say, his efforts will be ably aided by the officers of the A.M.A.

Test Proposed

One of the most interesting contributions to the program was included in the discussion by Surgeon General Parran of the United States Public Health Service. He proposes to have serologic test for syphilis included in the medical examination of every recruit. The suggestion would seem to offer a wonderful opportunity to determine the incidence of syphilis, to give it adequate treatment, and to go a long way towards its eradication. Whether or not, it is feasible and whether it will interfere with induction of the troops into service remains to be seen.

One thought occurs to those of us who are interested in maintaining the present form of the practice of medicine, and that is whether such examinations which are not strictly necessary, and which are made without charge by governmental agencies, will act as an example and open the

MINUTES OF THE CONFERENCE

The meeting of the State Chairmen of the Committee on Medical Preparedness of the American Medical Association held at the A.M.A. Headquarters in Chicago on Friday, September 20, 1940, was called to order by Dr. Paullin, Secretary of the Committee on Medical Preparedness. The roll call revealed that most of the states were represented by their chairmen of the Committee on Medical Preparedness.

Col. Charles B. Spruit from the Surgeon General's office of the War Department spoke of the selective draft program, explaining the various set-ups from the local board and its personnel to and including the Induction Board of the Army. He discussed the various classifications of selectees. In the course of the discussion he stated that the local medical examiner could not examine relatives; that the local board would be privileged to call in a physician in an advisory capacity. It was felt that the civilian physician who is in the second or third class would be the logical one to call for such duties. The status of the examining physician will be that of a government official without pay. The local examining physician cannot be a member of the armed force of the nation. The government has ruled that only practitioners of medicine can conduct examinations.

Medical Society to Indorse

A question arose as to the priority of reserve officers who would not be available for one reason or another, due to local circumstances and who would be placed on a priority list. When such men are called an endorsement will be made by the local medical society to the surgeon of the corps area from which the call came. He will in turn transmit this to the Surgeon General's office through military channels, and the Surgeon General will make the final decision. (In other words, if a reserve officer has assumed some obligation and is unable to get away at the time, the county society can state the reason to the surgeon of the corps area so that the applicant may be put on the low priority list.)

Internes in hospitals will not be called until

one year of service has been completed. They will also be placed, therefore, on a low priority list. Resident physicians, on the other hand, who are in their last few months of service, will be in the high priority list, subject to call. Students entering medical schools will not be drafted for at least one year. Registration of all students in the College of Science, Literature and the Arts will be necessary, but deferment will be made until July 1, 1941. Cadets of the Senior R.O.T.C. of the Army and Navy are exempt from registration.

No Group Deferments

There will be no exemption of any groups or agencies and deferment will not be made on any group basis. The merits of each individual case will be decided upon by the local board.

In case of a public health officer in a community being called, the State Board of Health will be consulted and will give its endorsement relative to the induction of such an official in a local community.

The Advisory Board is composed of specialists who will act in such capacity when called upon by the local examining board's physician.

Appeals

The Appeal Board, one for every 600,000 population, will review such matters as come before it in regard to individuals who do not wish to be inducted. Their decision will be final.

It was suggested that patriotic bodies, such as the American Legion, should use their influence to encourage selectees in registering.

Psychiatric Problems

The importance of neuropsychiatry was touched upon. Dr. Parran stated that 2.2 per cent of those inducted into service in the last war had evidence of neuropsychiatric lesions and that 2.2 per cent of every 400,000 men enlisted would eventually be government charges. It has been calculated that each individual costs the government \$30,000. In other words, in an army of 1,200,000 men the cost would be \$657,000,000.

Recruits to Be Radiographed

Col. Love of the Surgeon General's office stated that there would be approximately 15,000 men in the medical reserves, of whom 8,000 would be required by July 1, 1941. He also stated that x-ray examination of the chest would

be made in the case of all recruits before they are finally inducted and again at the time of discharge from federal service. These films are usually the 5 x 7 size, but Capt. Sutton stated that the Navy would use the 35 mm. film.

Navy Needs

Capt. Sutton, representing the Surgeon General of the Navy, stated that the Navy was having no difficulty in procuring the number of enlisted personnel up to the present time; that eventually 500,000 enlistments would be required for the naval services and that these would be trained in eight or ten training stations in the United States. There are 1,100 vacancies in the naval reserve and 208 vacancies in the medical corps of the Navy. The Bureau prefers the commissioning of recent graduates.

First Induction

The first induction will be that of 375,000 registrants. There will be 143,000 registration precincts in the United States. There will be 3,717 registration precincts in the State. There will be 412 in Hennepin County, 250 in Ramsey County, 242 in St. Louis County, and the remainder will be distributed throughout the state. There will be approximately 140 draft boards in the state. There will be 6,500 draft boards in the United States. Practically 16,500,000 men between the ages of 21 and 35 years will be examined. Out of every 100 men 63.7 per cent will be accepted.

The report of September 18 relative to the response of physicians to the questionnaire on Medical Preparedness reveals that the Seventh Corps Area, which includes Minnesota, has had the largest number of returns. On that date Minnesota had a return of 81.4 per cent.

F. L. SMITH

ATTACK BY AIR

With the shrewdness and determination worthy of a better cause, the Department of the Interior is now making use of the defense emergency to reform medical services to the civilian population.

Radio is the medium and the program which carried one telling blast was part of a series entitled, "This, Our America." It was called "Health and Education" and it was carried over the Blue Network August 21, 1940.

To begin with it is interesting to note that the government gives education in America a rating of 100 per cent both as to aims and accomplishment.

Inadequate Service Charged

Medical aims and accomplishments rate, by contrast, a small amount of perfunctory and grudging praise and a large amount of blame for inadequacy of services to one-third of the population with annual incomes under \$750.00, to mothers, to cancer sufferers, to workers in industry. By inference, indeed, medicine is accused of over-charging and of poor service generally to low income patients.

These programs are prepared and staged with all the latest radio tricks. Music and alternative narrators are used in the "Health and Education" broadcast, with a character named "Joe Average Guy" to ask questions and four victims to tell their distressful tales of neglect.

It is hard to see how any average layman who heard it could fail to be convinced of a terrible lack of medical and hospital services in this country. Most would hear between cues an equally terrible indictment of the medical profession for inertia and inability to handle its own problems—if nothing worse.

School System Praised

Many valid and even formidable criticisms of our educational system are heard within and without the ranks of educators these days but the Department of the Interior emphatically finds no fault or deficiency with the school system of the United States as a factor in our national defense.

Somewhat similar though less objectionable programs are also being offered to radio stations currently by the United States Public Health Service. One of these, recently submitted for study to the Committee on Radio, was a plea for earlier diagnosis of cancer and, incidentally, for more facilities where expert treatment might be available at little or no cost to patients. The Committee has not approved this program.

If War Fever Grows

The danger in all this is clear. Where the Wagner bill was halted in committee on its merits, a new health bill embodying actual state medicine as a defense measure will not be argued upon its merits at all, but upon its fancied con-

tribution to the total preparation for war. When and if war fever grows in the United States it may quickly become an act of treason to argue against any ill-conceived and unwanted measure for civil reform, if only it can be proposed in the name of national defense.

PROFESSION MUST ACT

Complete medical care for workers, particularly those engaged in defense industries, should be an integral part of the program of the National Defense Advisory Commission according to the Bureau of Co-operative Medicine, Dr. Kingsley Roberts of New York, medical adviser.

A statement to the Commission is printed in full in a recent bulletin from the Bureau in which attention is called to accumulated evidence gathered during the last ten years to prove that "we cannot rely upon present methods for the purchase and distribution of medical care."

"Industrial medical services to care for occupational injuries and illness are too limited to meet the need for increased efficiency," says this statement. "A proper program can admit of no less than complete medical care."

"With such a program there is reason to believe that absenteeism due to illness might be substantially reduced. A reduction of one quarter would have the direct effect of adding to our resources of skilled labor about six men for each thousand employed, or a saving of about 1,700 work days per year for each 1,000 men. The indirect effect of improved health upon productive capability is incalculable.

"As both labor and industry have a stake in the health of the worker, the role of the government should be to facilitate the initiation of organized medical services for these groups."

Danger Acute

Obviously from the above, there is a job to be done by organized medicine. Private advocates of compulsory sickness insurance, no less than government agencies, are losing no time in tying increased government medical services to defense measures. The danger to American medicine is acute. Physicians who see the danger will have to act as a body, definitely and promptly, not only in Washington but at the polls in November.

"ESSENTIAL INSURANCE"

(Monthly Editorial Prepared by the Medical Advisory Committee)

The carrying of liability insurance by drivers of automobiles is just as necessary the first hour of driving a new car as it is after years of use of the same car, the possibility of accident being just as great at one time as another.

Likewise, the possibility of a suit being brought against the beginner in the practice of medicine is just as likely, because of alleged malpractice, the first day of practice as it may be at any time during his professional career.

Most of the companies writing liability insurance in Minnesota have as one of their prime requisites that a purchaser of a policy be a member of his county and state society in good standing. This is rightly so but tends to work a hardship on the beginner in practice who may wish to buy a policy.

Your Medical Advisory Committee believes that to avoid this injustice a more liberal interpretation might be advanced by the companies under the following requirements:

1. That the applicant be licensed to practice in the state of Minnesota with the title of Medical Doctor.

2. That he make arrangements (the rental of an office, purchase of furniture, etc.) to become a settled practitioner in the community he proposes to practice in.

3. That he do nothing in the way of advertising to promote his acceptance in the community.

4. That investigation show him to be a man of high moral character, who from an ethical standpoint would become a valuable member of his medical society.

5. That after investigation, the president and the secretary of the County Medical Society must be willing to recommend him.

6. That he show his intention of becoming a member of organized medicine by filling out a tentative application for the county society at the time that the insurance company writes his policy, it being understood that the rules and regulations as to time of admittance into the county society are governed by the by-laws of that society and the approval of the board of censors.

7. That it be understood by him and the insurance company that if he is not elected to membership in the county society, the insurance policy which is issued to him becomes null and void and the unearned premium will be returned to him.

It might be well for the secretaries and members of component county societies to invite at once new men in their communities to medical meetings. This will promote future membership and give the newcomer in the community a feeling of the fellowship so necessary in these troubled times.

B. J. B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Saint Paul, Minnesota

J. F. Du Bois, M.D., Secretary

Fake Doctor Pleads Guilty to Petit Larceny in St. Paul

Re. State of Minnesota vs. Edward Alvin Johnson, also known as Edward Alvin Yonnson.

On September 5, 1940, "Dr." Edward Alvin Johnson, twenty-eight years of age, who gave his home address as Inglewood, California, entered a plea of guilty in Municipal Court of Saint Paul, to a complaint charging him with the crime of petit larceny. The charge was based on the theft by Johnson of a physician's stethoscope from a Saint Paul Hospital on August 23, 1940.

Johnson was arrested at 1469 Lafond St. by members of the Saint Paul Police Department, on August 29, 1940, following their investigation into the theft of the stethoscope. Judge Robert V. Rensch sentenced Johnson to sixty days in the Saint Paul Workhouse and suspended the sentence upon Johnson's statement that he desired to return to his home in California where he stated that his mother and wife resided.

Johnson stated that he left Los Angeles for Saint Paul on August 5, 1940. Upon his arrival in Saint Paul he posed as a physician and visited at four Saint Paul hospitals, where he claims he viewed two surgical operations and one birth delivery. Johnson also admitted that he had represented himself as a doctor in Los Angeles. At the time of Johnson's arrest members of the Saint Paul Police Department found a prescription book in his room and a number of surgical instruments and various medicinal preparations. Johnson was arrested before he had an opportunity to examine, or treat, any patients, consequently he was charged with petit larceny rather than with practicing medicine illegally. The only excuse offered by Johnson for his fraudulent representations was that he enlisted in the army in 1934, and was assigned to the medical corps as a hospital orderly. He claims to



have studied pre-medical subjects at Golden Gate Junior College, San Francisco, California. He told the Saint Paul Police Department that he was married on July 28, 1940, to a former Wavonia, Minnesota, girl who graduated as a nurse from one of the Saint Paul hospitals.

Johnson was interviewed by a reporter for a Saint Paul newspaper and told a rather elaborate story of having spent three years in Alaska with the United States Public Health Service. He claimed to hold memberships in numerous scientific organizations and that he received his medical degree at Berkeley, California. It subsequently developed that the entire story was false.

The Minnesota State Board of Medical Examiners wishes to caution the medical profession, and the hospitals as well, about the responsibility that attaches when an unlicensed person is permitted in an operating room or in a delivery room. Without the consent of the patient such an act is an illegal invasion of the privacy of the patient and can result in a serious lawsuit. It is a simple matter to make inquiry with respect to an individual's status from the standpoint of medical licensure. Satisfactory proof of a licensure should be required in every instance when a stranger represents himself as a physician. The Minnesota State Board of Medical Examiners is only too glad to co-operate with every physician and every hospital in the State of Minnesota in making impossible any such situation as occurred in this case.

Quack Doctor Fined \$1,000.00 at Rochester, Minnesota

Re. State of Minnesota vs. William F. Awe. William F. Awe, fifty-three years of age, who gave Denver, Colorado, as his home address, and who stated that he was one-fourth Cherokee Indian, was sentenced



on September 21, 1940 by the Honorable Vernon Gates, Judge of the District Court at Rochester, Minnesota, to pay a fine of \$1,000.00 for practicing healing without a basic science certificate. Judge Gates ordered that Awe be confined in the Olm-

sted County Jail until such time as the fine is paid, not exceeding six months.

Awe was arrested on September 14, 1940, by Detective George Rohde of the Rochester Police Department, and E. L. Antletz, Agent of the Minnesota Bureau of Criminal Apprehension, following the discovery that Awe was treating an eight months old Chester, Iowa, baby for eczema for which Awe was to be paid \$40.00. The method of treatment consisted of bathing the baby in mineral water and also giving some of the mineral water internally. The Minnesota State Board of Medical Examiners was immediately notified and on September 17, 1940 Mr. Brist filed a complaint against Awe in behalf of the Medical Board, following which Awe was arraigned in the Municipal Court at Rochester, Minnesota, before Judge Burt W. Eaton. Awe waived a preliminary hearing and was held to the District Court with bail being fixed at \$1,000.00.

At the time of his arrest, Awe was accompanied by a twenty-four-year old Burlington, Colorado, girl who stated that she was acting as his secretary. The investigation disclosed that Awe obtained the mineral water, also some so-called mineral earth, at South Bend, Texas. Awe represented the mineral water and mineral earth as being a cure for blindness, cancer, eczema, rheumatism, kidney trouble and many other

ailments. Awe sold the mineral water at \$15.00 per gallon and the mineral earth at \$1.00 for a four-ounce jar. The mineral water cost Awe 35 cents a gallon, and he obtained the mineral earth at no expense to him. Awe admitted that he had been arrested four times previously, once in South Chicago, Illinois, twice in Milwaukee, Wisconsin, and once at Anoka, Minnesota, the last three arrests being for bootlegging. Awe admitted that he had no training in medicine, pharmacy, or any other form of healing. Awe's only explanation to the Court for attempting such illegal practices was his need of money. After denouncing the defendant in no uncertain terms, Judge Gates imposed the maximum fine permitted under the law. Awe was unable to pay the fine and was taken to the County Jail to serve his sentence.

The Minnesota State Board of Medical Examiners wishes to acknowledge the prompt and efficient work done in this case by Chief Harry N. Tompkins of the Rochester Police Department, Detective George Rohde of the same Department, and E. L. Antletz, Agent of the Minnesota Bureau of Criminal Apprehension. The Minnesota State Board of Medical Examiners also wishes to acknowledge the co-operation of Mr. Thomas J. Scanlon, County Attorney of Olmsted County.

Steele County Jury Acquits Woman of Massage Charge

Re State of Minnesota v. Harriet Hershberger.

On September 13, 1940 a jury in the district court of Steele county brought in a verdict of not guilty in the case in which Mrs. Harriet Hershberger was charged with practicing massage without a license. The state introduced evidence to show that the defendant was giving massage treatments in her home at 422 E. Vine Street, Owatonna, and that she was paid \$1.25 per treatment. Mrs. Hershberger admitted that she was not licensed but claimed that she was just giving olive oil baths and divine healing. She also claimed to be a practical nurse. Notwithstanding the fact that none of the claims advanced by the defendant constitute a defense under the healing laws of Minnesota the jury found her not guilty.

The case was well tried for the state by Mr. Axel Anderson, county attorney of Steele county. The State Board of Medical Examiners requests that any evidence indicating that Mrs. Hershberger is continuing in her practices, be promptly called to their attention.

COUNTER PRESCRIBING A FEDERAL OFFENCE

It is worth every doctor's time to study thoroughly the provisions of the new Federal Drug and Food Act. The act is now in effect and places significant restrictions on the dispensing of drugs, particularly by the pharmaceutical profession. Drugs like the barbiturates and sulfanilamide are specifically restricted in their sale, and providing the druggist obeys the law, counter prescribing of such dangerous medicaments is definitely hampered.

Not only the druggist, but the doctor who dispenses these drugs from his office is affected by the regulation. Physicians who dispense drugs must go to the trouble of marking the complete name, dose, and other pertinent information on the package before giving it to the patient. Whether this portion of the law will be rigidly enforced must be proven by time, but it is well to note it is now a Federal Act that compels one to do so, and can be enforced.

Gone are the days when samples may be dispensed with careless abandon.

Bulletin Oklahoma County Medical Association.—

OF GENERAL INTEREST

Dr. and Mrs. Ralph V. Ellis of Saint Paul vacationed for three weeks in Mexico in August. They visited in New Orleans on their return.

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Dr. Henry Michelson of Minneapolis, who received minor injuries in an automobile accident, August 11, is now fully recovered and has returned to his practice.

* * *

Dr. Lawrence M. Larson of Minneapolis has been appointed medical examiner for the administrator of civil aeronautics of the Minneapolis district.

* * *

Dr. Robert E. Mattison has opened offices at 1951 Medical Arts Building, Minneapolis. His practice will be limited to obstetrics and gynecology.

* * *

Dr. George A. Pollock, who has been at the Mayo Clinic at Rochester, has returned to his home in Great Britain. His address is Peel Hospital, Clovensfords, Selkirkshire, Scotland.

* * *

Dr. Richard M. Hewitt of Rochester was in Washington, D. C., August 26, to attend the meeting of the Committee on Information of the Division of Medical Sciences of the National Research Council.

* * *

Dr. Northrop Beach, who recently completed an internship at Johns Hopkins Hospital in Baltimore, became associated with the University of Minnesota Hospitals as a medical fellow in pediatrics, September 1.

* * *

Dr. Charlotte M. Gast of Memphis, Tennessee, has been appointed assistant professor and assistant director of the course in medical technology at the University of Minnesota.

* * *

Dr. Edwin S. Fetcher, formerly of the University of Chicago, and Dr. Robert B. Dean of the University of Rochester, have been appointed instructors in the department of physiology, University of Minnesota Medical School.

* * *

Dr. Karl H. Pfuetze, who has been on the medical staff at the Nopeming sanatorium at Nopeming for the past three years, has accepted a position as physician on the staff of the Mineral Springs Sanatorium at Cannon Falls.

* * *

Dr. J. Willard Hanson, who has been a medical fellow in pediatrics in the University of Minnesota Hospitals, has accepted a position in the Health Service of the University of Kansas in Lawrence, Kansas. The appointment was effective September 1.

* * *

Dr. H. S. Diehl was in Washington D. C. about the middle of September to confer with Dr. Thomas Parran, Surgeon-General of the United States Public Health Service on health phases of the preparedness program.

Dr. Walter G. L. Tanglin of Mahomen, Minnesota, has taken over the practice of Dr. Philip C. Noble in Polson, Montana. Dr. Noble, a graduate of Rush Medical College, has become a volunteer fellow in the University of Minnesota Hospitals, Minneapolis.

* * *

The marriage of Dr. Rodney F. Sturley and Miss Jane Read of White Bear took place August 20. They are making their home in Minneapolis, where Dr. Sturley is a fellow in obstetrics and gynecology in the University of Minnesota Hospitals.

* * *

A fine new hospital to serve the people of northern Minnesota was opened recently at Roseau. Known as the Budd Hospital, it is under the supervision of Mrs. Marie Budd, who for years has maintained a hospital there.

* * *

Dr. C. O. Estrem of Fergus Falls recently suffered an attack of coronary thrombosis and has been a patient at St. Luke's Hospital in that city. He is convalescing very satisfactorily and expects to be able to resume his practice in a few weeks.

* * *

Dr. L. Gordon Samuelson, who has been practicing in Mankato, left early in September for Carlisle, Pa., where he took a five-weeks' training course before reporting for duty in the medical detachment at March Field, California.

* * *

Dr. Allen G. Johnson of Brainerd has taken over the offices and practice of Dr. N. J. Kulzer in Hastings. A graduate of the University of Minnesota Medical School, he completed his internship at St. Mary's hospital in Duluth in 1938. Prior to locating in Hastings, he practised in Duluth.

* * *

Minnesota physicians who took part in the program of the nineteenth annual American Congress of Physical Therapy in Cleveland, September 2-8, included: Drs. E. V. Allen, Earl C. Elkins, Roger L. Kennedy, Philip S. Hench, Frank H. Krusen and Edward F. Rosenberg, all of Rochester.

* * *

Dr. L. B. Wilson of Rochester, director emeritus of the Mayo Foundation, was principal speaker at the dedication of the beautiful new Museum of Natural History on the University of Minnesota campus, September 28. The dedicatory ceremonies took place at an open house in the evening. Other speakers included President Guy Stanton Ford, and James Ford Bell, principal donor of the museum. Completion of the Museum of Natural History is a dream come true for Dr. Thomas S. Roberts, director. A one-time practicing physician, Dr. Roberts has devoted many years in developing the museum.

OF GENERAL INTEREST

Dr. L. L. Kallestad has located in Hutchinson, opening an office in the Ritter Building. Dr. Kallestad, who was graduated from the University of Minnesota Medical School in 1938, interned at the Minneapolis General Hospital. During the past summer, he took care of the practice of Dr. Arthur Thompson at Cokato.

* * *

Dr. P. M. Mattill, assistant medical director of Glen Lake sanatorium, was chairman of arrangements for the eleventh annual homecoming for former patients of the sanatorium, September 14. The 300 visitors, all of whom have left the institution as cured, ranged in age from young folk to grandparents. The program included greetings by Dr. E. S. Mariette, superintendent.

* * *

Colonel Kent Nelson, M.C., U.S.A., who before his retirement last spring was Seventh Corps Area Surgeon with headquarters at Omaha, has been recalled to service at his own request and has been placed in charge of the Medical ROTC unit at the University of Minnesota. Colonel Nelson was graduated from the University of Minnesota Medical School in 1900.

* * *

Drs. J. A. Myers and Alex Blumstein of Minneapolis are scheduled to speak at meetings of the Minneapolis Nurses' Association, it is announced with the release of the organization's 1940-41 year book. Dr. Myer will give an illustrative lecture on "A South American Trip in the Air," November 13. Dr. Blumstein will speak March 12.

* * *

A proposal for the establishment of a \$250,000 fund to be collected through public subscription throughout the world for a memorial to the late Drs. William J. and Charles H. Mayo is being considered by the Mayo Memorial Commission, composed of seventeen representative citizens of Minnesota. State Senator William B. Richardson of Rochester is chairman of the commission, being appointed by Governor Harold E. Stassen.

* * *

Dr. Daniel F. McCann of Bemidji announces his association with Dr. T. P. Groschupf in the practice of medicine and surgery, effective October 1. Drs. Groschupf and McCann have their offices in the Barker building where Dr. Groschupf was located for a number of years in practice with the late Dr. E. H. Marcum. Dr. McCann has withdrawn from the firm of Drs. Johnson and McCann.

* * *

The Albert Lea Medical and Surgical Center is the name of a newly formed clinic in Albert Lea, of which Drs. W. L. Palmer, C. F. Palmer, D. L. Donovan, L. C. Barr and H. B. Neel are members. The clinic is located in the Hyde Building on East William Street.

With the exception of Dr. Neel all have been practicing in Albert Lea prior to the formation of the clinic. Dr. Neel recently completed a fellowship in the Mayo Foundation where he was a Fellow in Surgery.

* * *

Dr. John Mendenhall Snyder of Rochester, a fellow in surgery in the Mayo Foundation, accepted an invitation

of the trustees and General Alumni Society of the University of Pennsylvania to represent his alumni class at special convocations during the university's bicentennial celebration week. Dr. Snyder attended the School of Medicine at Pennsylvania, and is a member of the Class of 1934. As an alumni representative, he led his class in an alumni parade which was part of the program.

* * *

Renewed interest in the Minnesota Medical Foundation is reported by Dr. Erling S. Platou, president. The Foundation is sponsored by the Alumni Association of the University of Minnesota Medical School.

Already \$25,000 has been subscribed to the foundation for the benefit of needy superior medical students, and for aiding in worthwhile research projects for alumni.

* * *

Taking part in the dedication of a new 25-bed hospital in Warroad, recently, were Dr. A. F. Branton of Willmar, secretary, and Ray Amberg of Minneapolis, president of the Minnesota Hospital Association. This modern concrete hospital was built by WPA at a total cost of \$84,820, of which \$25,551 was contributed by the Village of Warroad and \$5,000 by the State of Minnesota through its Legislative Emergency Committee.

* * *

Dr. Charles F. Code, a former fellow in the Mayo Foundation, has been named a member of the staff of the Mayo Foundation and Clinic at the Institute of Experimental Medicine. Dr. Code was assistant professor of Physiology at the University of Minnesota Medical School from 1938-1940. During his fellowship in the Mayo Foundation, he studied in London as a Bayliss-Starling scholar. While there, he was lecturer in physiology in the University College.

* * *

In Ogden, Utah, the latter part of August to address a meeting of the Utah State Medical Association were Drs. J. T. Priestley and W. C. MacCarty of Rochester. Dr. Priestley presented two papers entitled "The conservative surgical treatment of stag-horn renal calculi" and "Carcinoma of the bladder with particular reference to total cystectomy." Dr. MacCarty spoke on "Is pernicious anemia a sign or a disease?" and "Classification of goiter."

* * *

"Common Communicable Diseases" is the Health Subject of the month. Special emphasis is being placed on scarlet fever, whooping cough and measles. Physicians may secure the monthly health packets from the Minnesota State Medical Association which distributes the bulletins as part of its Co-ordinated Medical and Public Health Education Program. The medical broadcasts by Dr. W. A. O'Brien tie in with the program.

* * *

"The Periodic Health Examination of the School Child" and "Tools of Health Education" are the subjects selected for the 1940-41 Continuation Study on Public Health Nursing. Centers for the three meet-

ings to be held in November, December and January are: Duluth, Virginia, Bemidji, Crookston, St. Cloud, Mankato, Rochester and Minneapolis, it is announced by Olivia T. Peterson, R.N., director of the Minnesota Department of Health, Division of Public Health Nursing.

* * *

Speakers at the thirty-fifth annual convention of the Minnesota Nurses' Association in Saint Paul, October 16, 17 and 18, will include Dr. Ralph W. Warnock of Saint Paul, whose topic will be "Heart Disease," and Dr. Herman E. Hilleboe of Saint Paul, medical coordinator for the Department of Social Security, Division of Social Welfare. The latter will discuss "The Proposed Public Health Program for the Prevention of Heart Disease Among Children."

Affiliated groups meeting with this association are the Minnesota League of Nursing Education and the Minnesota Organization for Public Health Nursing.

* * *

Dr. Peter D. Ward, superintendent of the Charles T. Miller hospital in Saint Paul, was reelected to the board of trustees of the American Hospital Association at its forty-second annual convention in Boston.

At the convention Dr. Ward presented a paper on "The Interdependence of Hospitals and Hospital Service Plans."

Dr. William A. O'Brien of Minneapolis gave the banquet address at the convention, September 19.

As part of the convention activities, the Minnesota Hospital Association sponsored a Minnesota Breakfast at the Statler Hotel, September 17, with President Ray Amberg of Minneapolis presiding.

* * *

Dr. E. S. Platou of Minneapolis was reelected president of the Minnesota State Board of Health at a meeting, August 29, and Dr. T. B. Magath of Rochester was elected vice president succeeding T. G. Bell of Duluth, who retired from the board.

Leo Thompson of Little Falls has been appointed to the board to succeed Mr. Bell, and Dr. F. W. Behmler of Morris has been named to succeed Dr. E. T. Fitzgerald, also of Morris.

Other board members are Ruth Boynton, M.D., Minneapolis; Prof. F. E. Bass, C. E., Minneapolis; A. G. Schulze, M.D., Saint Paul; A. C. Kean, D.D.S., Grand Rapids; and Prof. Gustav Bachman, Pharm. D., Minneapolis.

Dr. A. J. Chesley of Saint Paul was re-appointed by the board as secretary and executive officer.

* * *

Several Minnesota men will participate in the program of the American Academy of Ophthalmology and Otolaryngology when it meets in Cleveland, October 6 to 10, inclusive.

Drs. A. D. Prangen and Gordon B. New of Rochester will present papers at afternoon sessions. Dr. Prangen will also lead a discussion, as will Dr. Anderson C. Hilding of Duluth.

Among those scheduled to give instruction courses at the morning sessions are Drs. Frank E. Burch and

Hendrie Walter Grant of Saint Paul; Drs. Lawrence Randall Boies, Horace Newhart, and Walter E. Camp of Minneapolis; Drs. New, Henry P. Wagener, and Henry L. Williams of Rochester; and Dr. Hilding of Duluth.

Dr. Erling W. Hansen of Minneapolis is secretary of public relations for the academy, and Dr. William L. Benedict of Rochester is secretary for the Section of Ophthalmology.

Dr. Benedict will present a paper at the Pan-American Congress of Ophthalmology being sponsored by the Academy at the conclusion of its session. At this Congress, October 11 and 12, papers will be presented in the English, Spanish and Portuguese languages, with translations.

* * *

Seventy-three medical and administrative executives will make up the United States General Hospital unit, No. 26, which is being organized at the University of Minnesota under the direction of Dr. Harold Diehl, dean of medical sciences.

Plans for the organization of the unit were outlined by Dr. Diehl, who recently returned from Washington, D. C., where he conferred with officials about the formation of the wartime hospital unit.

The 73 medical and administrative executives will be taken from the faculty, the part-time faculty and the fellows doing postgraduate medical work at the university. Implemented with nurses, technicians and orderlies, such a staff could care for 1,000 wounded. Its rôle would be treatment well back of the lines of soldiers whose cases are too severe for care at front line first-aid stations.

In the unit will be specialists in communicable diseases, psychiatry, tuberculosis, heart diseases, skin disorders, metabolism, allergies, plastic, urologic and other types of surgery and a host of others including x-ray.

In addition to the physicians and the administrative staff, the hospital unit will consist of 120 nurses, 64 technical sergeants, 17 corporals, 140 first-class privates, and 279 privates.

Joining the hospital unit is solely on a volunteer basis at the university, yet not a single member of the staff has failed to forward his application. Not all are being accepted, however, because some are considered more valuable in their teaching capacities, and others are in categories already filled. The medical members join the unit by signing up with the army reserve corps. They will not be called into service, however, unless actual war breaks out. The nurses will be received through the Red Cross and military helpers will be assigned by the war department.

* * *

Among the seventy members of the University of Minnesota faculty promoted to a higher rank than they held last year, were thirty-two members of the Medical School staff. Of these, thirteen are from the Mayo Foundation staff.

Promoted from associate professor to full professorship were: Dr. Halvor O. Halvorson, bacteriology; Dr. Raymond N. Bieter, pharmacology; Dr. William A.

O'Brien, preventive medicine and public health, and director of Postgraduate Medical Education; Dr. Cecil J. Watson, professor of medicine, and director of the Division of Internal Medicine; Dr. William T. Peyton, professor of surgery and director of the Division of Neurosurgery; Dr. George O. Burr, professor of botany and of physiology and also director of the Division of Physiological Chemistry.

Raised to the rank of associate professor from assistant professor or other rank were: Dr. Starke R. Hathaway, clinical psychologist and associate professor of nervous and mental diseases; Dr. James B. Carey, clinical associate professor of medicine; Dr. Arthur C. Kerkhof, clinical associate professor of medicine; Dr. Wallace D. Armstrong, associate professor of physiology, and director of biological research in dentistry. Also Drs. Della G. Drips, Howard K. Gray, Samuel F. Haines, Howard R. Hartman, Howard L. Mason, Charles W. Mayo, Harry L. Smith and Marschelle H. Power (experimental biochemistry), all of the Mayo Foundation.

Promoted to assistant professor: Drs. Phillip Hallock, Charles J. Hutchinson, Horatio B. Sweetser, clinical assistant professors of medicine; Drs. Claude J. Ehrenberg and Everett C. Hartley, clinical assistant professors of obstetrics and gynecology; Dr. Herman E. Hilleboe, clinical assistant professor of preventive medicine and public health; Dr. L. Earle Arnow, assistant professor of physiology; Dr. Miland E. Knapp, radiology and physical therapy; Dr. Donald W. Cowan, Students Health Service. Also Drs. Byron E. Hall, H. Corwin Hinshaw, Charles H. Slocumb, Edward B. Tuohy and Marvin M. D. Williams of the Mayo Foundation.

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OPENINGS IN THE NAVY

The Medical Corps of the Navy is being increased in strength proportionate with the expanding Navy and the Marine Corps. Examinations for appointments as commissioned officers in the Medical Department of the Navy will be held January 6 to 9, 1941.

Appointments are being made in the Medical Corps, United States Naval Reserve, of male citizens of the United States, graduates of class "A" medical schools, who are under 50 years of age and who meet the physical and professional requirements.

The examination to be held in January will be for appointment as Assistant Surgeon, in the Medical Corps of the Regular Navy, effective approximately two months from date of examination, and for Acting Assistant Surgeon (Intern), effective July 1, 1941. Requests for authorization to appear for these examinations should be submitted to the Bureau of Medicine & Surgery, Navy Department, Washington, D. C., in sufficient time to permit the authorization to reach the applicant prior to December 30, 1940.

Applicants for appointments as Assistant Surgeon must be citizens of the United States between the ages of 21 and 31, graduates of Class "A" medical schools and have completed one year of intern training in a

hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association.

Applicants for appointment as Acting Assistant Surgeon (Intern) are not required to submit evidence of previous intern training, and are appointed for a period of eighteen months, during which time they serve as interns in the larger naval hospitals which are approved for intern training. After completion of one year of service Acting Assistant Surgeons are eligible for examination for appointment as Assistant Surgeons. Acting Assistant Surgeons and Assistant Surgeons receive the pay and allowances of a Lieutenant (junior grade).

The Medical Corps of the Navy is being increased in strength proportionate with the expanding Navy and the U. S. Marine Corps. Service for medical officers is active professionally and attractive in the shore duty, sea, and foreign shore station assignments. In the normal rotation of assignments every practicable consideration is given the officer's preference for the type of duty he desires. The Naval Medical School at the Naval Medical Center, Washington, D. C., offers a course of post-graduate instruction and instruction in those branches of medicine which apply particularly to the Naval Service. Under normal conditions newly appointed medical officers are assigned to this course upon entry into the service or during their first few years of naval service.

Naval medical officers are encouraged to develop a specialty after they have completed their first cruise at sea. Shortly before completion of his sea duty, the Navy doctor may request special training in the Medical Department specialty in which he is interested. Such requests are acted upon by a special board in the Bureau of Medicine and Surgery and, if approved, the Navy doctor is sent to a hospital for training and experience in that specialty for one year. Upon completion of this training, he is assigned to post-graduate instruction at one of the many medical centers in the United States for a period up to one year after which, in so far as is practicable, he is retained in that type of duty.

The service affords excellent opportunities for professional advancement. Medical officers receive the same pay and allowances as other officers of the Navy in corresponding ranks and the equivalent amount of service.

A circular of information for applicants for appointment as medical officers of the Navy, containing full information regarding physical requirements, professional examinations, rates of pay, and promotion and retirement data may be obtained by addressing the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Applicants for appointment in the Medical Corps of the United States Naval Reserve should be addressed to the Commandant of the Ninth Naval District, Great Lakes, Illinois, who will upon request furnish complete information regarding vacancies in ranks, etc., of officers of the Medical Corps, United States Naval Reserve in the district.

In Memoriam

William Hugh Carroll

Dr. Walter H. Carroll, senior resident physician at Glen Lake Sanatorium, died August 7, 1940, at Eitel Hospital, Minneapolis. Dr. Carroll was thirty-one years old and had been ill seven weeks.

He was born at Gilbert, Minnesota, March 3, 1909, and moved with his parents to Hibbing in 1913. Here he graduated from high school in 1927 and Junior College in 1929. He received his medical degree from the University of Minnesota Medical School in 1932. In 1933 he finished a year's internship at the University Hospital and finished a six months' fellowship in surgery at the same hospital in 1934. After filling a locum tenens for three months at Aitkin he went to Glen Lake Sanatorium in October, 1934, and was senior resident physician at this institution at the time of his death.

On July 2, 1938, Dr. Carroll married Fern Carlson, a social service worker at Glen Lake Sanatorium, but formerly of Saint Paul. She and an infant daughter, born October 19, 1939, survive him. He is also survived by his father and mother, Mr. and Mrs. Edward G. Carroll of Hibbing; a brother, John E. Carroll of Chicago, and two sisters, Katherine of Minneapolis and Margaret of Hibbing.

Joseph Michael Hilger

Dr. Joseph M. Hilger, for thirty-six years a practitioner at Iona, Minnesota, died suddenly at his home on September 5, 1940.

Dr. Hilger was born in Mazeppa, Minnesota, December 29, 1879. He received his early education at the Mazeppa public schools and received his medical degree at the University of Illinois in Chicago in 1903. He was licensed in Minnesota in 1904 and began practice that year in Iona.

Dr. Hilger married Rosella Haumasser June 30, 1908, at Fulda. Nine children have blessed this union, four sons and four daughters surviving.

Dr. Hilger was a member of the Catholic Order of Foresters and the Knights of Columbus.

Dr. Hilger began his career before modern automobile transportation became what it is, when a physician was forced to rely upon the horse and buggy. He will be sadly missed by the families he has helped and counseled during his thirty-six years of practice.

Alvah H. Jensen

Dr. Alvah H. Jensen of Hutchinson, Minnesota, died suddenly of a heart attack on July 8, 1940, at the age of forty-four.

Dr. Jensen was born February 13, 1896, in Wisconsin. He moved with his parents to Minden, Nebraska, where he attended high school. After a year of medicine at the University of Nebraska, he continued his medical education at the University of Minnesota. In

April, 1918, he enlisted in the Navy and made several trips across the Atlantic during the war. After the war he completed his medical education at the University of Minnesota and served his internship at Bethesda Hospital, Saint Paul, and in the Shriners' Hospital. He practiced in Saint Paul a year before going to Hutchinson in August, 1926.

Dr. Jensen was a member of the McLeod County Medical Society, the Minnesota State and American Medical Associations.

Louis Watson Satterlee

Dr. Louis W. Satterlee, for over thirty years health officer of Alexandria, passed away at his home August 30, 1940, at the age of eighty-five.

Dr. Satterlee was born at Nunda, New York, April 21, 1856. In 1868 he moved with his parents to Etna, Pennsylvania. Later he attended Western University at Pittsburgh. From 1876 to 1878 he taught rural schools in Alleghany County, and the next twelve years were spent in Bradford, Sawyer City, West Hickory and Grand Valley, Pennsylvania.

On April 9, 1884, Dr. Satterlee married Mary Adella Prosser. Two children, Cleora Lois (Mrs. Harry J. Havens) now of Miltona, and Levi Herbert Satterlee, now of Sunland, California, survive.

Dr. Satterlee moved to Chicago in 1891 and studied medicine at the Hahneman Medical School there. After graduation in 189, he located in Murdock, Minnesota. Here his wife died in 1899.

In 1902 Dr. Satterlee moved to Clearwater, Minnesota, and September 12, 1903, he married Josephine Boutwell. Two children, Dorothy and Kenneth were born of this union.

In 1905 Dr. Satterlee moved to Alexandria, and with the exception of a few years spent at Pequot, Parkers Prairie and Villard, Alexandria has since been his home. He was a member of the Congregational Church and of the Modern Woodmen.



REPORTS and ANNOUNCEMENTS

MINNEAPOLIS CLINICAL CLUB

The program for the October tenth meeting of the Minneapolis Clinical Club in the Medical Arts Building follows:

"Kodachrome Photography in Dermatology"—Dr. Carl W. Laymon
"Factitious Proctitis Caused by Irradiation" and "Value of Macroscopic and Microscopic Examination of Excised Rectal and Anal Tissue"—Dr. Harry W. Christianson.
"Gastroenterostomy" (a motion picture)—Dr. James M. Hayes.

Dr. Lawrence R. Boies is president of the club, and Dr. Ernest R. Anderson, secretary.

MINNEAPOLIS SURGICAL SOCIETY

The Minneapolis Surgical Society will have Dr. Alton Ochsner of New Orleans as its guest speaker at its meeting Thursday, November 7. The topic of Dr. Ochsner's address has not yet been announced.

MINNESOTA PATHOLOGICAL SOCIETY

The Minnesota Pathological Society will hold its first meeting of the 1940-41 season at 8 p. m. October 15 in the amphitheater of the Institute of Anatomy at the University of Minnesota. The speaker will be Dr. Wesley W. Spink, whose topic is "Pathogenesis and Treatment of Staphylococcal Infections." There will be a discussion by Dr. E. T. Bell.

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Fourteen new members were added to the Olmsted-Houston-Fillmore-Dodge County Medical Society at a meeting in Rochester, September 4.

Accepted were Drs. R. Beck, John S. Drapiewski, Eldon W. Erickson, William J. Ferguson, Harry Penn Harper, Charles S. Joss, Wallace W. Lindall, Arthur J. Movius Jr., Harold A. Smedal, Charles S. Stroebel Jr., Ray D. Williams, Clyde O. Wood, William Walter Wood and Russell Grant.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Officers of the Southern Minnesota Medical Association elected at the association's meeting in Red Wing, September 23 are: Dr. Walter Henry Valentine of Tracy, president; Dr. A. E. Benjamin of Minneapolis, first vice president; Dr. Edward H. Juers of Red Wing, second vice president. Dr. N. W. Barker of Rochester was re-elected secretary-treasurer.

Dr. James Morrow of Austin is the retiring president.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL ALUMNI

A program of scientific papers and clinics has been arranged for the annual homecoming and meeting of

the Alumni Association of the University of Minnesota Medical School, October 25, the day preceding the University Homecoming football game.

The morning session will be followed by a short business session, and a complimentary luncheon at noon at the University of Minnesota Hospitals. Dr. Harold Benjamin, association president, will preside at the annual meeting.

The program of scientific papers and clinics will continue through the afternoon. It is also planned to arrange tours of the Medical Science building and the University of Minnesota Hospitals for visiting alumni.

The Class of 1920 will be honored guests at this homecoming.

WABASHA COUNTY MEDICAL SOCIETY

The Wabasha County Medical Society will hold its seventy-second annual meeting at Plainview, Thursday, October 10, 1940.

The program will include a business session at 4 p. m., a dinner at 6:30 p. m., and a scientific session immediately following the dinner. Entertaining physicians are Dr. E. W. Ellis of Elgin, president of the society; Dr. D. G. Mahle of Plainview, vice president; and Dr. R. A. Glabe of Plainview. Entertainment for the ladies will be provided under the auspices of the Women's Auxiliary.

Dr. W. F. Wilson of Lake City is secretary of the society.

The program for the scientific session follows:

President's Address:

1. "Duties of Physicians in Relation to Medical Preparedness."
2. "Report of a Case of Ruptured Gastric Ulcer in a Diabetic Patient."—Dr. E. W. Ellis, Elgin.

"Review of Our Present Knowledge Concerning Acute Poliomyelitis."—Dr. F. M. Feldman, Rochester, District Director, Minnesota Department of Health.

"Report on Appendectomies."—Dr. C. G. Ochsner, Wabasha.
"Physical Therapy in General Practice."—Dr. M. E. Knapp, Minneapolis.

MAYO FOUNDATION ALUMNI

The twenty-second annual meeting of the Alumni Association of the Mayo Foundation for Medical Education and Research will be held in Rochester, October 23, 24 and 25.

There will be scientific programs in the mornings and afternoons.

A special program has been planned for the evening of October 23, with talks by Dr. Donald C. Balfour, director of the Mayo Foundation; Dr. Theodore C. Blegen, dean of the Graduate School at the University of Minnesota; Dr. Louis B. Wilson, emeritus director of the Mayo Foundation; Dr. Guy Stanton Ford, president of the University of Minnesota; and Dr. George E. Vincent, president of the University of Minnesota

(Continued on Page 752)

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, March 7, 1940

President, WILLARD D. WHITE, M.D., in the Chair
Secretary, HARVEY NELSON, M.D.

Symposium on Fractures and Other Trauma

INJURIES TO THE SHOULDER JOINT

GEORGE D. EITEL, M.D.
Minneapolis

In reviewing injuries of this most movable joint, we are faced with many conditions which should be discussed but can only be mentioned because of the brief time allotted.

Contusions and sprains of the shoulder are common and my only purpose in mentioning them is because of the possible injury and rupture of the supraspinatus tendon and the injury to the long head of the biceps muscles. Diagnosis is sometimes difficult and may be overlooked. I also wish to mention very disabling sequelae following contusions, such as subdeltoid bursitis, and also arthritis and peri arthritis which may result from long continued immobilization and low grade infection. The treatment should consist of physiotherapy and more recently x-ray therapy has given excellent results.

Fractures of the clavicle are also common and treatment is directed toward obtaining extension on this long bone by various types of methods, all of which obtain the same result, which is usually one of union with some over-riding. Open operation is seldom necessary.

Fractures of the scapula are rare due to the firm attachment of muscles. A fracture through the blade seldom gives displacement. Fractures of the neck of the scapula or the lower edge of the glenoid require traction on the upper extremity in abduction or preferably in hypertension and abduction so that the capsular attachments will elevate the fragment. It must be held in this position for four to six weeks, depending on the amount of callus formation.

Injury to the brachial plexus of nerves must be kept in mind; this may be of varying degrees from a mild paresthesia to a complete paralysis. Treatment is directed toward relaxing tension on the plexus by placing the arm in abduction. Late pressure may develop from callus resulting from healing of severe fractures of the clavicle and removal of the callus from the inferior surface of the clavicle is sometimes necessary.

Dislocation of the clavicle both at the manubrial and acromial end occurs. Many times the patient says he has a bone sticking up on his shoulder which shows while he stands and the weight of his upper extremities makes the deformity apparent; but on lying down the end of the clavicle stays in place. Hence, x-rays should be taken with traction on the arm so that the acromioclavicular separation is demonstrable.

Dislocation of the head of the humerus is also a

common injury. One should be certain that there is not an accompanying fracture of the upper end of the humerus before reduction is attempted. For this, x-ray pictures are essential. If a fracture is also present, a different method of replacing the dislocation is used. The general rule is that the closer the fracture is to the dislocated head, the more difficult it is to replace the dislocation, and the lower down the fracture is, the easier to reduce the dislocation. This is due to the attachment of muscles on the proximal fragment. All dislocations should be reduced before the fracture is treated.

Fractures of the upper end of the humerus have been divided into fractures of the anatomical neck and of the surgical neck. However, we rarely see, or perhaps have never seen, a true anatomical neck fracture. Kocher, in 1896, classified them as follows: (1) supra-tubercular; (2) per-tubercular; and (3) infratubercular and he was experimentally on cadavers unable to produce a fracture of the anatomical neck in an adult. This classification, I think, is still the best and should be used more often.

Fractures involving the upper end of the humerus have caused all of us many difficulties: (1) in the reduction of the fractures; (2) in the maintenance of reduction by either an aeroplane splint, which has been in vogue for about twenty-five years, or by a massive plaster cast, or by fixed bed traction; and (3) in the long and many times permanent disability due to inability to abduct normally. The patient has likewise suffered from the cumbersome apparatus worn. We all have seen fractures in fairly good position with the upper extremity in the *adducted* position but when the conventional aeroplane splint was applied, the distal fragment was displaced into the axilla.

Drs. Howard and Eloesser of Stanford University, San Francisco, Cal., published a paper on this subject in 1934 in the *Journal of Bone and Joint Surgery*, and I would like to review briefly their most interesting work. All seventy-nine cases of fractures of the upper end of the humerus which they report were treated by the following method with excellent results and with a much reduced disability.

Briefly, their reduction is obtained by traction with the arm in the adducted position by virtue of the long head of the biceps bridging the fragments, and the remaining untorn periosteum. These structures hold the fragments in position. In three of their cases the long head of the biceps muscle was severed so the position could not be maintained, and open operation was done.

The dressing is as simple as the method of reduction. A small pad is placed in the axilla and along the

arm. The forearm is held flexed by a sling, while the arm is loosely bound to the body; the elbow is left free to allow the weight of the arm to act as a traction force.

The success of restoration of function rests on intelligent use of exercise. Gentle massage may be used from the beginning by removing the body bandage. A small range of passive motion may be used in the first week, carefully controlled by the surgeon himself. At the end of the second week active motion is instituted. The bandages are removed; the patient stands with the sound arm resting on a chair or desk and, bending forward, allows the injured arm to hang unsupported. The arm may be safely swung forward and backward and in small circles. The range of motion is increased so that by the end of the third week from seventy-five to ninety degrees of abduction are possible by tilting the trunk in this stooping-standing position. Such ranges of motion may be undertaken early, since at no time do the muscles bear the full weight of the limb as in the upright position. At the end of the fourth week more strenuous active motion, to the point of pain, is advised, and in eight weeks' time the patient has a painless, movable, and useful shoulder, with almost normal range of motion that increases as the arm is used in the daily tasks of the individual.

PERIPHERAL NERVE SURGERY

GEORGE R. DUNN, M.D.
Minneapolis

Peripheral nerve injuries of clinical importance occur quite commonly. Recognition of a nerve lesion prior to any operative or manipulative procedure in an acute surgical case is highly important. It is quite possible in a very short time to determine whether or not there is any nerve injury of magnitude. In making these quick, rough tests, it is not necessary to carefully test out the entire motor and sensory distribution. For example, the ulnar nerve usually supplies sensation to half the ring finger, the small finger and the corresponding portion of the hand on the palmar and dorsal surfaces; consequently, in testing for gross sensory loss in the ulnar nerve one can quickly test any loss of sensation on the small finger.

In the upper extremity we may consider rough tests for four important nerves:

Musculospiral. A gross lesion of this nerve produces a wrist drop, and impaired sensation over the dorsum of the thumb.

2. Median nerve. Injury to this nerve produces a loss of feeling on the palmar surface of the index and middle fingers and a corresponding area over the palm of the hand.

3. Ulnar nerve lesions produce a loss of sensation on the small finger and a corresponding area on the palm of the dorsum of the hand.

The circumflex nerve which winds about the neck of the humerus is frequently injured in shoulder joint dislocations and injury to this nerve produces a paralysis of the deltoid muscle and an impairment in sensation over the deltoid area.

In the lower extremity the nerves most frequently injured are:

1. The external popliteal branch of the sciatic which can readily be tested by checking the sensation on the dorsum of the foot and the power to dorsiflex the foot.

2. The tibial nerve, less frequently injured, can be checked by determining any gross loss of sensation on the plantar surface of the foot and the ability to plantar flex the foot.

3. Sciatic nerve injury produces signs referable to the external popliteal nerve, the tibial nerve or a combination of both.

4. Femoral nerve injuries cause a loss of power of the quadriceps muscle and a loss of sensation over the overlying skin area.

These nerves may be injured: (1) by trauma (without severance), (2) by compression in scar or callus; (3) by complete or partial division due to penetrating or incised wounds.

A nerve merely traumatized usually recovers in four to eight weeks with rest and proper splinting. The splint should be applied in such a manner as to relax the muscles which the nerve supplies to prevent overstretching of these muscles during the temporary cessation of the function of the nerve. The musculospiral nerve may be so affected. In this instance the hand, wrist and fingers should be supported by a cock-up splint in a position of dorsiflexion.

All these nerves described are mixed motor and sensory nerves and when one encounters a motor loss without any sensory loss one should bear in mind the possibility of poliomyelitis.

The physiological continuity of a nerve is occasionally, although rarely, interrupted by scar tissue formation or callus formation pressing on the nerve. Simple liberation of the nerve from the scar or callus (neurolysis) by an operative procedure and proper protection of the nerve by muscle or fat to prevent recurrence of the pressure usually give a satisfactory result.

Puncture, incised, or lacerated wounds may result in a partial or complete severance of the nerve. When the nerve is partially severed and the condition is not recognized at the time of the injury, a scar usually forms in the nerve preventing the establishment of physiological continuity. Whether or not a condition of this sort requires later operative procedure depends on the magnitude of the injury, the amount of pain, and the loss of function it causes. If the scar is small and discrete (Fig. 1, upper diagram), it is sometimes possible to resect the scar and suture without damage to the remainder of the nerve. By this method one can be fairly certain of not increasing the magnitude of the nerve injury irrespective of the result obtained in the partial nerve suture.

When the scar is diffuse and involves the entire nerve to a certain extent (Fig. 1, lower diagram), a complete division of the nerve may be necessary to remove the scar. Whether or not this is advisable will depend entirely on the extent of the nerve lesion. Nerve regeneration is never complete after resection and end-to-end suture. The question will naturally arise, in any incomplete nerve lesion of this sort, whether the

end-result after resection of a diffuse scar and suture of the nerve will improve the function of the nerve. Resection should not be advised unless improvement is fairly certain.

Causalgia is a painful condition which occurs in a variety of incomplete nerve lesions but on occasions

mattress suture of fine silk or catgut is placed to approximate the nerve sheath. Care should be taken in placing this first suture not to rotate either end of the nerve out of its natural position as each nerve has its own architecture. After placing the first suture, the devitalized portion of the nerve can be entirely cut

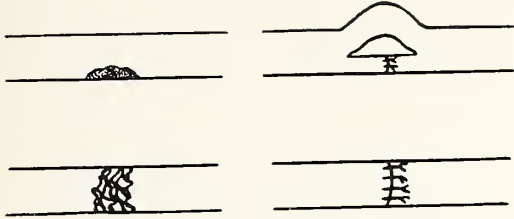


Fig. 1. Partial and complete resection of nerve for intrinsic scar (diagrammatic).

arises from intrinsic or extrinsic scars affecting the nerve. Pressure from extrinsic or intrinsic scars may give rise to considerable pain, circulatory and trophic disturbances. If the scar is extrinsic, neurolysis is the procedure of choice. If the scar is intrinsic, partial or complete resection of the scar may be indicated depending on the severity of the lesion. X-ray therapy in either case may be of some value. We have observed definite improvement following x-ray therapy in painful extrinsic and intrinsic scars affecting digital nerves which are difficult to treat surgically (intrinsic scars) due to the small size of the nerve.

Occasionally one encounters a scar confined to the nerve sheath, or nearly so, producing constriction of the nerve. Resection of the scar in the sheath in some of these cases gives excellent results.

Endeavoring to dissect out small groups of nerve fibers from an intrinsic scar may be possible in rare instances where the scarring is comparatively slight, not dense and confined to a limited area. Care and judgment must, however, be exercised in a procedure of this sort to avoid any extensive dissection of the nerve which will interfere with a later procedure.

After completing any surgical procedure on a nerve where formation of scar or adhesions may tend to invalidate the result, it is well to protect the nerve with fat or paratenon.

In cases where there has been a complete severance of the nerve from any cause, early diagnosis and primary end-to-end suture are indicated. The wound should be thoroughly cleansed, a careful debridement done and the nerve carefully sutured. The rough, uneven ends of the nerve should be carefully cross sectioned with a sharp knife until the normal fibers are visible.

At this stage of the procedure the nerve can be handled by placing clamps or forceps on the obviously devitalized portion of the nerve which is to be trimmed away and not cutting entirely through the nerve until after the first suture has been placed. After obtaining, by partial cross-section, visibly good nerve fibers on both the proximal and distal ends, a fine interrupted or

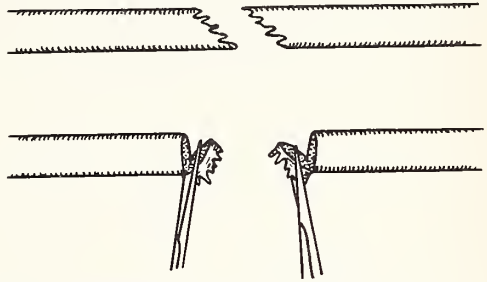


Fig. 2. Resection of lacerated nerve ends preliminary to primary suture (diagrammatic).

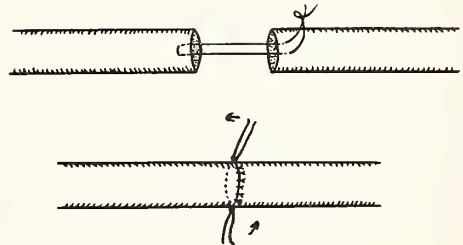


Fig. 3. Nerve suture half completed. By rotating the nerve by means of long sutures, the unsutured side of the nerve can be exposed and sutured (diagrammatic).

away and the second suture placed in the nerve sheath just opposite to the first suture. These two sutures can be left long. We thus have a suture at 12:00 o'clock and 6:00 o'clock, figuratively speaking. Using these sutures as retractors, the remainder of the sutures can be placed on one surface and, one of the original long sutures being passed beneath the nerve and the nerve rotated to present the opposite side, the remainder of the sutures are placed. This reduces to a minimum the handling of the nerve sheath by forceps. No sutures should be placed except in the nerve sheath. Close approximation of the nerve sheath throughout should be obtained.

Primary nerve suture permits approximation with minimal tension of the nerve, reduces the healing time, minimizes the degenerative process which occurs in the distal portion of the nerve, minimizes the muscular atrophy which follows a nerve lesion, prevents retraction of the nerve, and eliminates neuroma formation. If, through any complication, regeneration fails to occur after primary suture, the close approximation of the nerve ends simplifies secondary suture.

Secondary nerve suture is frequently done a considerable length of time after the original injury. Considerable separation of the nerve ends is frequently found. A neuroma will almost invariably be found on

the proximal segment of the nerve. Considerable atrophy of the distal segment of the nerve will have occurred and, consequently, the diameter of the proximal segment is considerably greater than the diameter of the distal segment.

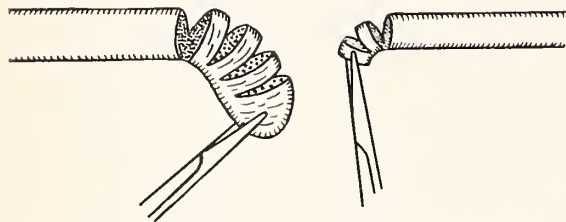


Fig. 4. Repeated cross-section of neuroma and scar, exposing good fibers for secondary suture (diagrammatic).

These conditions all interfere to a certain extent with nerve suture. Both the proximal neuroma and the scarred distal portion of the nerve must be repeatedly cross-sectioned until good fibers are visible in both segments. Due to the fact that the nerve fibers in the distal segment have undergone considerable degeneration, these fibers do not stand out as clearly on cross section as the fibers in the proximal segment and one must use considerable care in cross-sectioning the distal segment to remove all scar tissue and yet not sacrifice an unnecessary portion of the distal segment of the nerve. When good fibers have been exposed in both segments, the secondary suture is executed in the same manner as described for primary suture. Much larger portions of the nerve must, however, be sacrificed in secondary suture.

There may be a considerable gap between the nerve ends. This may be overcome by one or a combination of the following methods: (1) stretching the nerve; (2) flexion or extension of certain joints which tend to allow approximation of the severed ends; (3) transplantation of the nerve (for example, transplanting the ulnar nerve from its normal bed to a position anterior to the condyle of the humerus and flexing the elbow); (4) use of a nerve graft in the presence of a great gap.

All four methods lessen the chances of a fairly complete recovery compared with primary suture. Prompt recognition of a nerve lesion and primary suture is, therefore, highly important.

A nerve graft may be the only solution for an otherwise irreparable defect.

The type of graft diagrammed in Figure 5A may be used when a graft of proper diameter is available. For example, resection of an entire segment of the sciatic nerve in the thigh may be necessary because of a tumor. The external portion of the sciatic nerve (external popliteal group of fibers) may then be used as a graft to establish the continuity of the internal group (tibial fibers). In the event that sufficient regeneration takes place in the internal group of nerve fibers to supply some function to the plantar flexor muscles of the foot a drop-foot apparatus may be worn to com-

pensate for the paralysis of the muscles supplied by the external popliteal branch of the nerve, and the patient may be able to make some use of the leg.

In other instances two or more strands of a smaller nerve (Fig. 5B) may be used as a graft to bridge a

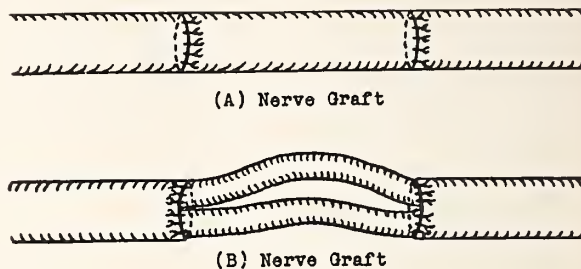


Fig. 5. Two types of nerve graft.

defect in a larger, more important nerve. The internal cutaneous nerve in the arm may be used in this manner to restore the continuity of the ulnar, median or musculospiral nerve.

Nerve fibers grow slowly and if a nerve graft 5 or 6 centimeters in length is used it will require a considerable period of time for the fibers to reach the distal line of suture. The possibility of scar tissue sealing off the second line of suture must be remembered and the advisability of resecting this area and resuturing at the proper time should be considered. I have only seen one fairly successful nerve graft.*

In doing either a primary or secondary nerve suture, one must be rather careful in the identification of structures for suture of a nerve to a tendon has occurred. This error is most commonly made in suturing the proximal end of a severed median nerve to the distal end of the palmaris longus or one of the other flexor tendons of the wrist or hand. The proximal end of a severed tendon retracts more markedly than the proximal end of the severed nerve so it frequently happens that the nerve will be first located in the wound. The nerve presents a greyish color, has a definite sheath, and a typical appearance on cross section as compared with the white, shiny appearance of a tendon. Rather firm traction on the distal end of the median nerve may produce slight flexion of the thumb, index and middle finger but this action is not easily confused with the definite response one obtains from traction applied to the distal end of a tendon.

Postoperative proper splinting to prevent joint movement throwing undue strain on the line of suture is important. Baking and massage and electrical stimulation tend to minimize muscular atrophy during the process of nerve regeneration. Care, however, must be exercised in instituting physiotherapy to avoid throwing undue strain on the line of nerve suture too early.

Of the commonly injured nerves, the musculospiral and the external popliteal frequently give the most satisfactory results. These nerves are both largely motor in function, have comparatively small numbers of

*Examined at 2nd Northern General Hospital, Leeds, England, in 1917.

sensory fibers and control coarse movements, the dorsi-flexion of the hand and foot respectively.

End-results of nerve suture vary between no return of function and approximately an 80% return of function. Generally speaking, the best results follow primary suture although very good results may be obtained by secondary suture performed at a considerable interval of time after the injury. The complete failures are usually due to separation of the suture line following suture under too great tension or improper immobilization of adjacent joints, thus allowing tension to be placed on the suture line.*

TREATMENT OF TRIMALLEOLAR FRACTURES OF THE ANKLE

M. C. NELSON, M.D.
Minneapolis

Because this paper has been accepted for publication in *Surgery, Gynecology and Obstetrics* and will appear in this periodical in an early issue, it is possible to give only a brief summary of the paper as presented before this Society. The presentation was prefaced with a few remarks of a historical nature, and then the results of the treatment of 359 ankle fractures treated at the Minneapolis General Hospital in a five-year period ending July 1, 1939, were summarized. From a detailed study of these fractures, several conclusions were drawn and these illustrated by lantern slides of drawings and x-rays.

Briefly, the conclusions are: A "classical" trimalleolar fracture, that is, one in which the posterior tibial fragment involves one-third or more of the distal tibial articular surface, is the most difficult of all ankle fractures to treat, and probably also the most poorly treated. Open reduction and internal fixation is practically always necessary. A "minimal" trimalleolar fracture, that is, one in which the posterior tibial fragment involves less than one-third of the distal tibial articular surface is a common ankle fracture and can be reduced by manipulation, and the reduction maintained by a plaster cast. Considerable offset of the posterior fragment does not preclude a good result.

INJURIES OF THE POSTERIOR URETHRA

T. H. SWEETSER, M.D.
Minneapolis

The subject assigned to me covers such a wide field that time forces me to limit my discussion to one type of injury. I wish to discuss the rupture of the posterior urethra where it passes from the prostate into the triangular ligament, since this is so often associated with fractures of the pelvis, and other serious injuries.

*For a summary of the bibliography on this subject up to January, 1930 (1958 references) see, "Peripheral Nerve Injuries" by Lewis J. Pollock, M.D., and Loyal Davis, M.D., published by Paul B. Hoeber, Incorporated, New York, in 1933.

That injury of the urethra is in itself a serious injury and demands prompt and accurate diagnosis and adequate treatment.

Occasionally the urethra in that location is partially severed and may be treated simply by drainage with an indwelling catheter. I can remember two patients whom I treated in that way with good results. One was an old man who was butted against a post by a bull, suffering fracture of the pelvis and partial severing of the urethra. The other suffered a similar injury when the wall of a trench fell in on him.

Occasionally there is simply the matter of proper diagnosis of some minor urethral lesion in the presence of a fracture of the pelvis or other severe injury. One patient recently had a severe head injury and a dislocation of the hip. He did not void and the house surgeon suspected rupture of the posterior urethra when he was unable to pass a catheter. He actually had a tight old stricture of the membranous urethra and was adequately relieved by passage of filiforms and followers.

The serious injury which I wish principally to call to your attention is a complete rupture of the urethra with a displacement of the prostate and bladder upward away from the triangular ligament and with collection of a hematoma in the intravaginal space. Fortunately the bladder is not usually ruptured and the patient has not voided any urine into the hematoma. He comes to the hospital usually in severe shock with a fracture of the pelvis and sometimes with a head injury or other associated trauma.

Drainage of the perivesical tissue is imperative and any attempt to put the patient in lithotomy position for perineal incision would risk further severe damage from the broken pelvic bones and would not adequately solve the problem of drainage and repair. A suprapubic cystotomy and evacuation of the perivesical hematoma is essential; the patient's condition may be so poor that no further initial treatment is justified. If anything further can be done without too much risk, the torn ends of the urethra should be brought together as well as possible.

My first attempt at accomplishing this last effect was in August, 1928, when I used a Pilcher Bag by the method which has since been described and illustrated by Ormond and Cothran in 1934.² In our case we exerted traction on the tube passing through the urethra by means of rubber bands running to the foot of the bed. Unfortunately a fistula was created at the penoscrotal junction by pressure of the tube, because of the fairly sharp curve at that point. The use of a wire basket to prevent this sharp curve would probably have prevented the formation of the fistula.

Another patient with a similar injury was treated by my associate, Dr. Polzak, by suprapubic cystotomy and insertion of a soft rubber catheter through the damaged urethra under suprapubic guidance without any attempt to bring the damaged segments together. This patient healed well but we have had considerable difficulty in treating the traumatic stricture and have had to remove one bladder calculus by cystotomy.

Still another child was treated by my associate, Dr.

Gingold, by suprapubic cystotomy. Because of the patient's extremely poor condition nothing more was done for twelve days, when bladder drainage was instituted through perineal urethrotomy; the suprapubic drainage tube was removed six days later and the perineal catheter sixteen days later still. Occasionally dilatation of the urethra was done for a time and the result was satisfactory.

It seems to me that one can depend on intra-abdominal pressure to push the bladder and prostate down into position without traction. When the patient's condition permits it, at the time of cystotomy, one need only place a catheter through the ruptured part of the urethra to guide proximal segments into close apposition with the distal segments. The method described by H. W. Martin in 1935¹ seems to me to best accomplish this mostly quickly and with less disturbance to the patient. A full curved sound is passed from the bladder through the prostatic and membranous urethra to the bulb where its end is pressed against the perineum. Without elevating the thighs the operator feels the end of the sound through the perineum and releases it through a small midline incision. A rubber tube is prepared with numerous holes on the side to insure drainage of the perivesical tissue, as well as the bladder. The end of this tube is placed on the end of the sound and guided from the perineum through the urethra into the bladder and is held in place by string fastened to the suprapubic wound.

The simplicity and effectiveness of this method can be appreciated by referring to the drawings which accompany the article by Ormond and Cothran and comparing the two methods.

References

1. Martin, H. W.: Injuries to posterior urethra. *Jour. Urol.*, 34:718, (Dec.) 1935.
ture of pelvis. *Jour. Am. Med. Assn.*, 102:2180-2181, (June 30) 1934.
2. Ormond, J. K., and Cothran, R. M.: Simple method of treating complete severance of urethra complicating frac-

MAYO FOUNDATION ALUMNI

(Continued from Page 746)

from 1911 to 1917. Following this meeting, the members will adjourn and go to the Mayo Foundation House where portraits of Dr. William J. and Charles H. Mayo will be unveiled.

The annual banquet of the association will be October 24. The annual business meeting has been scheduled for the afternoon session, October 25.

Dr. Lester D. Powell of Des Moines is president of the association; Dr. Porter P. Vinson of Richmond, Virginia, first vice president; Dr. William H. Long of Fargo, North Dakota, second vice president; Dr. J. Richard Aurelius of St. Paul, secretary; and Dr. D. Morrison Masson of Rochester, associate secretary and treasurer.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

MANAGEMENT OF THE CARDIAC PATIENT. William G. Leaman, Jr., M.D., F.A.C.P. Assistant Professor of Medicine in Charge of Department of Cardiology, Woman's Medical College of Pennsylvania; Cardiologist Woman's College, Memorial, Northeastern Hospitals, and Philadelphia Hospital for Contagious Diseases, etc. 705 pages. Illus. Price, \$6.50, cloth. Philadelphia: J. B. Lippincott Co., 1940.

CHILD CARE AND TRAINING. Fifth Edition. Marion L. Faegre, Assistant Professor of Parent Education; and John E. Anderson, Director of Institute of Child Welfare, University of Minnesota. 320 pages. Illus. Price, \$2.50, cloth. Minneapolis: University of Minnesota Press, 1940.

APPLIED PHARMACOLOGY. Hugh Alister McGuigan, Ph.D., M.D., F.A.C.P. Professor of Pharmacology and Therapeutics, University of Illinois, College of Medicine. 914 pages. Illus. Price, \$9.00, cloth. St. Louis: C. V. Mosby Co., 1940.

TEXTBOOK OF MEDICINE. Fifth Edition. Edited by Russell L. Cecil, A.B., M.D., ScD. Professor of Clinical Medicine, Cornell University Medical College; Associate Attending Physician New York and Bellevue Hospitals, New York City. Associate Editor for Diseases of Nervous System: Foster Kennedy, M.D., F.R.S.E. Professor of Clinical Neurology, Cornell University Medical College; Attending Physician, New York Hospital; Visiting Physician in Charge Neurological Service, Bellevue Hospital; Consulting Physician New York Neurological Institute. 1744 Pages. Illus. Price, \$9.50, cloth. Philadelphia: W. B. Saunders Co., 1940.

PHYSICAL DIAGNOSIS. Second Edition. Ralph H. Major, M.D. Professor of Medicine in the University of Kansas. 464 pages. Illus. Price, \$5.00, cloth. Philadelphia: W. B. Saunders Co., 1940.

EPIDEMIC ENCEPHALITIS. Third Report by the Matheson Commission, Willard C. Rappleye, M.D., Chairman, Columbia University Press, Morningside Heights, New York. Pages XI-493. Price \$3.00.

The Matheson Commission was established through the generosity of Dr. William J. Matheson in the spring of 1927. Its first two years of work consisted largely of collecting the published data on the epidemiology, etiology and treatment of epidemic encephalitis. The first report was published in 1929, the second in 1932. Laboratory research was begun by the group in 1929 under the direction of Dr. Frederick P. Gay and has been specially concerned with herpes-like viruses.

The section on etiology summarizes the work done throughout the world from 1930 to 1938 in regard to the etiology of epidemic encephalitis; St. Louis type encephalitis; Japanese B type encephalitis; human encephalitis caused by the viruses of Eastern and Western equine encephalomyelitis; post-vaccinal encephalitis; post-infectious encephalitis; Australian x-disease and

hemorrhagic encephalitis. The greatest emphasis, of course, has been placed upon the first three mentioned. Two extremely important discoveries have been made: namely, the isolation of distinctly individual viruses causing St. Louis type encephalitis and Japanese B type encephalitis.

An exhaustive study of the treatment of epidemic encephalitis is given with attention called to the fact that it is difficult to evaluate treatment in this disease because of the variability of symptoms in the acute, sub-acute and chronic stages.

Of the various medications and procedures used in acute epidemic encephalitis, few are viewed favorably.

In 1933 the first summer epidemic of encephalitis to appear in the Western Hemisphere was reported from St. Louis, Missouri. A small outbreak had been noted in Paris, Illinois, in 1932. Another epidemic appeared in St. Louis in 1937. Clinically and epidemiologically, the illness closely resembles Japanese B type encephalitis but the two are differentiated immunologically. The epidemics have been preceded by a period of great heat and drought. Increase of incidence with increasing age is striking. Females and males were affected in the same ratio that they occurred in the general population. The mortality rate was about 20% as contrasted with 45-50% for epidemic encephalitis during epidemic periods, and 60-75% in epidemics of Japanese B type encephalitis. As noted above, a distinct virus has been isolated and its specificity demonstrated. Transmission

by non-human agents, including insect vectors, was excluded early. Direct contagion is infrequently recorded. Here again transmission is most likely through unrecognized carriers.

The Matheson Commission has published a carefully compiled survey of the work done all over the world in regard to the etiology, treatment, and epidemiology of encephalitis. Its claims for the laboratory and clinical research of its staff are very modest. More than 3,500 references are listed in the bibliography. The material is clearly and interestingly presented. This report forms a very useful reference book for laboratory workers and clinicians working on this exceedingly interesting, important but complicated disease.

WALTER P. GARDNER, M.D.

INTRODUCTION TO MEDICINE. Don C. Sutton, M.D., Associate Professor of Medicine, Northwestern University School of Medicine. With introduction by Ada Belle McCleery, R.N., Superintendent, Evanston Hospital, Evanston, Illinois. With 144 Text Illustrations and 14 Color Plates. St. Louis: The C. V. Mosby Company, 1940.

The appearance of a new medical textbook is no novelty. Unfortunately too many books appear that could well have remained unpublished since they add nothing new in material advance in the science or in the method of presentation by which the subject matter is presented more concisely, more interestingly or more

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BOOK REVIEWS

easily comprehended. Sutton's Introduction to Medicine is a very welcome addition to medical literature. It is a book delightful to read and is authoritative in context. The subject matter is well systematized and the discussion of each topic is clear and concise. The introductory paragraphs to the discussion of the various diseases give clear definitions and descriptions of the disease. The presentation of symptoms and treatment under the various diseases, though brief, is comprehensive and thorough. The main physical findings are well incorporated in the discussions.

This book gives a very satisfactory bird's-eye view of the whole field of internal medicine. There are brief chapters on Bacteriology, Parasitology, Pathology, Laboratory Procedures, Dietetics and other fields of interest to the nursing profession in addition to the main subject matter which deals with all the different types of diseases and their treatment. This book can be recommended unreservedly to all training schools, nurses in training and graduate nurses as well as all those interested in a brief but comprehensive view of the field of medicine.

MOSES BARRON, M.D.

DERMATOLOGIC THERAPY IN GENERAL PRACTICE. Marion B. Sulzberger, M.D., and Jack Wolf, M.D. \$4.50. 680 pages. Illus. Chicago: Year Book Publishers, 1940.

Most textbooks on dermatology follow a uniform style—that is, the texts are classified in sections and each entity is taken up in definite order, namely, etiology, pathology, symptomatology and treatment. In this book under review, the conditions are entirely different. The chief concern of the authors here is treatment, whereas in most books treatment occupies a very minor part of the chapter. The average general practitioner is looking for just such a treatise as this. It is not to be denied that symptoms are important as well as diagnoses. Nevertheless, the doctor who gets a dermatological case is concerned mainly with the cure of it, probably more than with recognition.

The book covers most of the skin entities which one encounters, and the conditions selected for discussion have been carefully and wisely chosen. We find, for instance, an excellent chapter on the eczemas and the allergies and these are most painstakingly considered, having in view the latest investigations on these subjects. A very good chapter also covers the acnes, emphasizing the importance of radiation treatment. In following the instructions laid down here, the average practitioner could readily treat all acne cases which come to his office. Similarly, psoriasis and the fungi are

mentioned, and particularly the skin tumors, such as basal and squamous cell carcinomas which are handled most painstakingly and accurately as to their treatment.

Throughout the book there is a list of the therapeutic agents which are useful in treating the various skin conditions, for instance, lotions, baths, powders, combinations which make up salves and a concise description of roentgen and radium therapy. The specialist will find in this book a concise condensation of everything used in everyday practice. The general practitioner will welcome this book because it is mostly therapy and therapy is what he wants.

E. Z. SHAPIRO, M.D.

NEWER NUTRITION IN PEDIATRIC PRACTICE. I. Newton Kugelmass, M.D. \$10.00. 1,155 pp. 183 illus. Philadelphia: Lippincott Co., 1940.

This is an overwhelming book. Its scope is tremendous; every possible relation of nutrition to the growth, development and disease of children is discussed at length.

The book is divided into three main units:

1. *Nutritional Physiology* discusses the maintenance and metabolism of the child's body both as regards organic and inorganic nutrients, for as stated, "an intimate appreciation of body mechanisms displaces empirical, traditional methods by scientific procedures.

2. *Nutrition in Health* takes us from the newborn, with the usual complete discussion of formulas for every need, through the childhood period and ends with an excellent discussion of the psychology of the poor eater.

3. *Nutrition in Disease* calls the roll of all disease; nutritional, deficiency, metabolic, allergic, infectious and regional. However, the author does not adhere strictly to his text, as witness the section on infectious disease, wherein many conditions are discussed which have little relation to nutrition.

It is disappointing that there is no separation of statement between material or opinions which are the writer's own and those of others, for although a bibliography is given at the end of each chapter, no direct credit is given in the text for material drawn from individual investigators. Many procedures are included as good practice, i.e., intraperitoneal fluid and sinus transfusion, which are no longer countenanced by many pediatricians. Also, one hesitates to recommend this book for general reading, since many statements are made which would indicate a final decision had been reached on problems that are still subject to some controversy.

EARL E. BARRETT, M.D.

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CLINICAL AND SURGICAL ASPECTS OF SPREADING PERITONITIS COMPLICATING ACUTE PERFORATIVE APPENDICITIS*

JOHN O. BOWER, M.D.

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Philadelphia, Pennsylvania

IN Philadelphia in 1922 a preliminary investigation revealed that the mortality of acute appendicitis was very high.†

A survey of 1,002 clinical records of patients operated upon for acute appendicitis in two of the largest hospitals disclosed the fact that the causes for the high mortality, delay in hospitalization and the administration of laxatives, are controllable. Through the efforts of Andrew A. Cairns, M.D., then Director of the Department of Public Health of Philadelphia, a city-wide survey of the clinical records of acute appendicitis cases in twenty-eight hospitals was made in 1930. The results obtained confirmed the findings of the initial survey and supplied statistics and facts with which a prophylactic campaign was inaugurated. The results of this continued education of the public show a consistent reduction of the mortality as shown by five subsequent surveys.

During the ten years the prophylactic campaign has been in progress surgical research on spreading peritonitis, the cause of over 92 per cent of the deaths, has been conducted.

In 1933 the Medical Society of the State of Pennsylvania appointed a Commission for the reduction of the mortality of acute appendicitis and a prophylactic campaign has been since conducted throughout the state by its members, one from each of the twelve Councilor Districts with

*Presented before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

†Dr. Hoffman of the Prudential Life Insurance Company had published a national statistical study which showed that the mortality of acute appendicitis in the United States was (1) 30 per cent higher than Scotland, (2) 51 per cent higher than Germany, (3) 73 per cent higher than England and Wales, (4) 76 per cent higher than New Zealand, (5) 83 per cent higher than Italy, and (6) 115 per cent higher than Irish Free State.

TABLE I. MORTALITY OF ACUTE APPENDICITIS IN
PHILADELPHIA

Six Surveys

Year	No. of Cases	No. of Deaths	Mortality Per Cent
1928-29	5,121	306	5.97
1930	3,095	149	4.01
1931	3,142	138	4.39
1932	3,546	122	3.44
1933	3,783	134	3.54
1937	4,186	102	2.44

their District and County committees, numbering over 300 physicians and surgeons.

The first Pennsylvania state-wide survey was completed April 1, 1940.

The results of the Philadelphia prophylactic campaign, surgical research, and now the results of the Pennsylvania campaign, indicate that:

1. Patients do not die from acute appendicitis; they die from spreading peritonitis.
2. Patients with appendicitis-peritonitis should be managed by surgeons who have some knowledge of the immunologic aspect of the problem.
3. The prophylactic campaign is the surest method of reducing the mortality.
4. In considering a plan for prevention of deaths from appendicitis-peritonitis the prophylactic removal of the appendix in the very young must not be overlooked, as there is no mortality other than the unavoidable catastrophe that can be attributed to the operation *per se*, approximately one in 1,000.

In Table II are listed the nine principal causes of death in the United States, with the number that die annually from each, and the age group in which most deaths occur.

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE II. PRINCIPAL CAUSES OF DEATH IN UNITED STATES

Disease	Number of Deaths Annually	Group in Which Most Deaths Occur
Heart	371,675	70 - 80
Cancer	149,126	60 - 70
Nephritis	126,879	70 - 80
Pneumonia—		
Lobar	67,778	50 - 60
Bronchial	51,600	75 - 85
Accidents	110,249	20 - 30
Apoplexy	103,560	70 - 80
Tuberculosis	71,527	20 - 30
Diabetes	30,406	65 - 75
Appendicitis	20,000	10 - 20

Acute appendicitis is a disease of youth. The average age is twenty-three years; death occurs at the average age of thirty-four. It is estimated that over 18,000 die each year in the United States, 3,240 before the age of twenty.

Deaths from appendicitis-peritonitis can be eradicated by definite instruction in the schools. As shown by the following table, over 40 per cent of cases occur between the ages of ten and twenty and over 53 per cent between one and twenty.

In Philadelphia the high school students have been instructed for ten years, in Pennsylvania for only five. Notice the difference in the mortality (Table IV).

TABLE III. MORTALITY IN DECADES
40.47 Per Cent of Cases in 2nd Decade

Ages in Decades	MALE			FEMALE			
	Recoveries	Deaths	Mortality Per Cent	Recoveries	Deaths	Mortality Per Cent	Total
1-10	1,236	53	4.11	1,045	40	3.68	2,374
11-20	3,624	76	2.05	4,227	55	1.28	7,982
21-30	2,647	64	2.36	2,280	24	1.04	5,015
31-40	1,121	55	4.67	730	17	2.27	1,923
41-50	641	69	9.71	405	36	8.16	1,151
51-60	281	51	15.36	235	31	11.65	598
61-70	112	31	21.67	101	31	23.48	275
71-80	31	14	31.11	16	5	23.81	66
81-90	5	6	54.54	2	0	0	13
91-100	1	0	0	0	0	0	1
Totals	9,699	419	4.14	9,041	239	2.57	19,398

All Cases, Average Age—23.4 years; Recoveries—23 years; Deaths—34.2 years.

TABLE IV. DELAY—MORTALITY 1937

	PHILADELPHIA			PENNSYLVANIA		
	No. Cases Recovered	No. Cases Died	Mortality Per Cent	No. Cases Recovered	No. Cases Died	Mortality Per Cent
Admitted Within 24 hours	2,059	16	.77	9,061	124	1.36
Admitted Between 25-48 hours	1,179	35	2.97	5,792	223	3.85
Admitted Between 49-72 hours	342	14	4.09	1,778	105	5.90
Admitted After 72 hours	606	37	6.10	2,767	206	7.44
Totals	4,186	102	2.44	19,398	658	3.39

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE V. DELAY AND MORTALITY—APPENDICITIS-PERITONITIS

	Year	Admitted within 24 Hours Per Cent	Perfora- tions Per Cent	Spreading Peritonitis Cases Admitted Per Cent	Total Cases Mortality Per Cent
Philadelphia	1928-29	32.08	42.96	13.54	5.97
	1930	30.31	35.84	15.25	4.01
	1931	29.60	35.30	15.62	4.39
	1932	32.40	29.02	12.80	3.44
	1933	30.06	26.25	12.03	3.54
	1937	49.19	12.21	8.26	2.44
Pennsylvania	1937	46.71	17.64	12.07	3.39

Table V shows that by earlier operation and by increasing the percentage of those admitted to hospitals in the first twenty-four hours the percentage of perforations and the mortality can be reduced.

Table VII shows the results of laxatives on the mortality of spreading peritonitis.

TABLE VI. ACUTE APPENDICITIS—APPENDICITIS-PERITONITIS
Results of Laxative Administration

	No. of Patients	No. of Deaths
No Laxative Administered	1,733	27 (1 in 64)
One Laxative Administered	2,723	135 (1 in 20)
More than One Laxative Administered	839	71 (1 in 12)

TABLE VII. SPREADING PERITONITIS MORTALITY
Results of Laxative Administration

	No. of Patients	No. of Deaths	Mor- tality Per Cent
No Laxative Administered	141	23	16.31
One Laxative Administered	567	128	22.57
More than One Laxative Administered	260	69	26.54

TABLE VIII. MORTALITY OF ACUTE APPENDICITIS
IN PHILADELPHIA

Year	No. of Cases	No. of Deaths	Mortality Per Cent	No. of Lives Saved
1928-29	5,121	306	5.97	
1930	3,095	149	4.01	36
1931	3,142	138	4.39	50
1932	3,546	122	3.44	89
1933	3,783	134	3.54	92
1937	4,186	102	2.44	148
	22,873	951	4.15	415

High school students are warned about the dangers of delay in hospitalization and the administration of laxatives. In all, 110,000 high school students in Philadelphia, and 630,293 in Pennsylvania were told that the mortality of appendicitis-peritonitis increases with each twenty-four hours.

We warned them about laxatives—when they develop acute abdominal pain Nature stops the movements of the intestines so that the inflammation will remain localized. If they take laxatives the intestines are thrown into activity which may result in rupture and appendicitis-peritonitis.

APPENDICITIS WARNING

For pain in your stomach—

Don't take a laxative or physic.

Don't take anything by mouth.

See your doctor immediately.

If he says it's appendicitis and advises operation—

Don't delay going to the hospital.

Laxatives and delay frequently cause spreading peritonitis and death.

This warning is published by The Medical Society of the State of Pennsylvania.

Each high school student should be given a warning sticker with the request that he take it home and affix it to the family medicine cabinet where it can be read by the other members of the family. They should be told that when anyone develops abdominal pain some organ inside the abdomen is not functioning properly. Pain is a warning. The first symptom of acute appendicitis is general abdominal pain which later centers in the lower right side, the region of the appendix.

High school students are being taught to recognize acute appendicitis. Does this plan pay in dividends of lives saved?

An attack may not be accompanied by nausea

or vomiting. There may not even be a rise in temperature. The most important thing to have done is a blood count. When the appendix becomes inflamed, tenderness develops and Nature stops movements of the intestine because of the urgency of keeping the infection confined to the appendix.

In the proposed plan to educate the high school student to recognize acute appendicitis, where does the family physician fit into the set-up? He has four vital functions: (1) he must establish or disprove his patient's "homemade diagnosis;" (2) if he concurs in the diagnosis he must see to it that his patient is placed in the hands of a surgeon—not an operator; (3) if he does not agree with the "homemade diagnosis" he must determine definitely what is wrong with his patient; and (4) he should participate in the prophylactic campaign.

Even when a youngster is intelligent enough to describe the character of the initial abdominal pain and can demonstrate with a finger the maximum point of tenderness, and even though in 90 per cent of instances he tells the physician what is wrong with him—a complete examination, which includes a rectal examination, should be made. Catastrophes have occurred because physicians have not examined patients' abdomens, and catastrophes have been prevented by youngsters refusing to take laxatives ordered by family physicians. The family physician must consider himself a consultant if fewer mistakes in diagnosis are to be made.

The selection of a surgeon by the family physician is important. It must be remembered and reiterated that an appendectomy may be the simplest or the most difficult of operations. I have mentioned that the family physician should consult a surgeon and not an operator. The difference is this: the operator operates; the surgeon manages. The operator can and does successfully remove intact appendices but he treats the perforated and the non-perforative appendices alike. The perforated appendix requires management. It requires the best the hospital affords. Why? Because over 92 per cent of the mortality is in this group. One of every four patients admitted to hospitals with perforated appendices dies.

When patients die following operation, the operator thinks they die of *what they had when he operated upon them*, and not *what he did at*

operation. The operator uses one kind of incision, one kind of anesthetic, and one kind of operation. He prides himself on how fast he can remove an appendix. He reports his successes in the form of appendiceal mortality, covering up the true mortality of spreading peritonitis by a camouflage of non-ruptured appendices, which have no mortality.

The family physician is the logical person to tell the public—which begins with his patients—about the prophylactic campaign to prevent death from appendicitis-peritonitis. He should use the warning stickers and he should be willing to speak before high school assemblies and lay organizations.

Finally, the family physician and surgeon should attempt to convince their State Health authorities that appendicitis-peritonitis is a public health problem; that it is as much an immunologic problem as the seven most frequent communicable diseases, and that the same amount of money should be spent in a publicity campaign as is spent in immunizing children against measles, diphtheria, typhoid, et cetera.

TABLE IX. PUBLIC HEALTH ASPECT OF APPENDICITIS-PERITONITIS

	Minnesota	Pennsylvania
Population—1937	2,652,000	10,158,000
No. High School Students, Junior and Senior	175,007	631,293
Deaths from Seven Most Frequent Communicable Diseases	223	945
Deaths from Appendicitis-Peritonitis	307	1,085

There is no mortality from acute appendicitis. Spreading peritonitis causes 92.4 per cent of the so-called appendicitis deaths. Patients do not die of acute appendicitis; they die of spreading peritonitis.

The facts in Table X were obtained from the abstracts of 38,085 clinical records.

TABLE X. MORTALITY IN APPENDICITIS AND APPENDICITIS-PERITONITIS

	Number of Cases	Deaths
Acute Appendicitis	28,235	104 (1 in 271)
Appendiceal Abscess	4,935	101 (1 in 49)
Spreading Peritonitis	4,915	1,302 (1 in 4)
Total	38,085	1,507 (1 in 25)

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE XI. MORTALITY IN ACUTE APPENDICITIS AND SPREADING PERITONITIS

Acute Appendicitis				Spreading Peritonitis		
Philadelphia Year	Number of Cases	Number of Deaths	Mortality Per Cent	Number of Cases	Number of Deaths	Mortality Per Cent
1928-29	5,121	306	5.97	698	237	33.95
1930	3,095	149	4.81	472	124	26.25
1931	3,142	138	4.39	491	120	24.44
1932	3,546	122	3.44	457	101	22.10
1933	3,783	134	3.54	455	112	24.61
1937	4,186	102	2.44	346	89	25.72
Total	22,873	951	4.15	2,919	783	26.82
Pennsylvania 1937	19,398	658	3.39	2,342	608	25.95

That patients die from spreading peritonitis, not appendicitis, is further corroborated by the fact that 22,000 clinical records previously abstracted in six Philadelphia surveys show the same results within a fraction of a per cent.

Patients admitted to hospitals with a diagnosis of acute appendicitis with an intact appendix do not die from this disease, statements on their clinical records to the contrary. These patients die a catastrophic death. Of the 658 deaths, 118 were catastrophes — twenty-nine unavoidable, eighty-nine avoidable.

The twenty-nine unavoidable catastrophes represent the hazards coincident to any group of comparable size. Surgeons accept them as inevitable. The majority occurred in the later decades of life. Only seventeen of the twenty-nine were unruptured. This number (17) represents the total mortality of the 16,046; only one in 944 died.

In the avoidable group, a total of eighty-nine deaths, errors in surgical management were responsible for seventy-one, errors in diagnosis for eighteen. Patients' relatives, as well as the sur-

geon, know when a death following operation is unavoidable. Explanations are unnecessary. Catastrophic deaths in the avoidable group, however, are difficult to explain, not only to the family, but to the family physician as well.

Errors in Diagnosis.—In this presentation it will be impossible to consider each of these in detail. Pneumonia, the most common error, occurs most frequently in the juvenile. A correct diagnosis can be made at times only by exhausting every possible means at our disposal; careful history, leukocyte count, x-ray, consultation.

TABLE XII. CATASTROPHIC DEATHS UNAVOIDABLE

Embolism	11
Cardiac Dilatation (so-called)	6
Coronary Disease	5
Myocarditis (so-called)	2
Thrombosis	1
Atelectasis	1
Apoplexy	1
Pulmonary Infarct	1
Uremia	1
Total	29

TABLE XIII. CATASTROPHIC DEATHS AVOIDABLE

Errors in Diagnosis	Errors in Management
Pneumonia	8
Intestinal Obstruction	2
Ruptured Cecum	1
Ruptured Duodenal Ulcer	1
Ruptured Gastric Ulcer	1
Acute Salpingitis	1
Typhoid Fever	1
Diabetes	1
Myelogenous Leukemia	1
Otitis Media	1
Total	18
	Appendix Ruptured on Removal
	Anesthetic Deaths
	Hemorrhage
	Postoperative Venoclysis
	58
	8
	4
	1
	71

Usually operation is decided upon because of rigidity. If rigidity is the deciding factor favoring operation then operation should be delayed, because an extensive rigidity is usually due to spreading peritonitis resulting from perforation. Delay for deliberation or deliberate delay until a definite diagnosis can be established is justifiable. The importance of the rectal examination should be remembered. It is far more important in a suspected acute surgical abdomen in children than a simple abdominal examination. Immediate operation in the presence of spreading peritonitis has a mortality rate of 27 per cent. The death rate of patients operated upon for suspected acute appendicitis, but who actually have pneumonia, approximates 75 per cent.

Intestinal obstruction is unusual but it occurs about once in 500 cases; an appendiceal abscess, partially blocking coils of intestine, is responsible. Deaths are due to spreading peritonitis, induced by the operator when he blindly inserts his hand into the peritoneal cavity and ruptures an abscess, in attempting to deliver the obstructed loop. It is better surgery to enlarge the incision.

Errors in Management. — Hemorrhage — a death has occurred from post-operative hemorrhage following removal of an acutely inflamed appendix in about 1 in 4,000 cases. This can be prevented by first ligating the stump and then inverting it with a very fine chromic catgut suture. If the suture is crossed at the mesenteric junction the purse string will compress a branch of the posterior ileocecal artery and the proximal branch of the appendicular artery, which are usually responsible for the bleeding.

Anesthetic Deaths.—Satisfactory notation regarding the anesthetics administered were obtained in only 14,894 of the 19,398 records abstracted. There were eight anesthetic deaths. The average age of those who died was forty; on admission to the hospital the average temperature was 99.4, pulse 105. Five of the eight had unruptured appendices; three had peritonitis. Six of the eight died on the operating table.

The results of this survey show that 3,640 patients were given ether without a death; 7,307 were given gas alone or in combination, with five deaths; 581 were given avertin alone or in combination, with one death.

A spinal anesthetic was given to 2,111 patients.

Two died. One was given spinocaine. The other anesthetic was not mentioned. Local anesthesia was used in only 114 instances. There were no deaths. Ether is still the safest anesthetic.

TABLE XIV. ACUTE APPENDICITIS—APPENDICITIS—PERITONITIS ANESTHESIAS

14,894 Administered—8 Deaths
6 General, 1 Spinal, 1 Unknown

Anesthetic	Number	Deaths
Nitrous Oxide		
Oxygen-Ether	6,582	4
Nitrous Oxide Oxygen	725	1
Avertin, alone and combined	581	1
Veneth. Epival, etc.	45	0
Ether	3,640	0
Ethyl Chloride and Ether	640	0
Cyclopropane	237	0
Ethylene	124	0
Ethyl Chloride	95	0
Total	12,669	6

Spinal Anesthetic	Number	Deaths
Not Mentioned	762	1
Pro-Novocaine	538	0
Pantocaine	273	0
Neocaine	269	0
Spinocaine	230	1
Metycaine	32	0
Anesthetol	5	0
Nupercaine	2	0
Total	2,111	2

Local Anesthetic	Number	Deaths
Novocaine	114	0

TABLE XV. APPENDICITIS—PERITONITIS—CLINICALLY APPLIED PATHOLOGY

LOCALIZED MASS—	Appendix, serous coat intact, partially or completely covered with lymph or omentum—both. (Fig. 1)
LOCALIZING PROCESS—	Appendix, serous coat perforated. Perforation sealed with lymph, omentum or intestine. (Fig. 2) Beginning abscess surrounded by omentum or intestine—both.
LOCALIZED PROCESS—	Frank abscess. (Fig. 3)
SPREADING PROCESS—	Spreading peritonitis. (Fig. 4)

Rupture of acutely inflamed appendices at operation was responsible for the greatest number of avoidable catastrophic deaths. The spreading peritonitis which followed was so virulent that it will be considered under the caption "Hyper-

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE XVI. ACUTE APPENDICITIS—APPENDICITIS-PERITONITIS
DRAINAGE—MORTALITY

	Acute Appendicitis		Appendicitis-Peritonitis	
	Not Drained	Drained	Not Drained	Drained
No. of Cases.	14,136	1,840	126	3,301
No. of Deaths.	0	6	74	544
Mortality Per Cent.	0	.33	58.73	16.48

acute Perforative Group.”—This catastrophe occurred once in each 200 patients operated upon with intact appendices.

Two years ago a clinical pathological classification of Acute Appendicitis-Peritonitis was published, based on what is found by the surgeon at operation—not what he leaves in the peritoneal cavity after operation or what the pathologist finds at postmortem. The pathological process can be described as either an inflammatory mass or an inflammatory process.*

Let us consider first the localized mass. The mortality is 1 in 169. Of the 15,976 clean cases, 14,136 were not drained. There were no deaths. 1,840 were drained and 6 died.

These surgeons should question their surgical judgment in draining non-perforative cases when they study the results shown in the drainage table above. If a surgeon at operation finds a perforated appendix, if he is doubtful as to whether or not the serous coat is intact, or if hemorrhage cannot be controlled by ligature, the insertion of drains is justifiable. It is not only definitely unnecessary but undesirable to insert drains of any kind into the peritoneal cavity to remove serous, serosanguinous or purulent fluid if the serous coat of the appendix is intact, because this fluid has a definite protective value. It is one of the earliest manifestations of Nature's attempt to develop resistance to microörganismal invasion. Titration of this fluid against the toxin of the *Clostridium welchii* shows that it contains antitoxin in 33.33 per cent of cases. The antitoxic titre of this fluid is highest in patients suffering from a non-perforative recurrent attack, in which the serous coat of the appendix had ruptured in a previous attack, but was subsequently sealed.

The amount of antigen absorbed during the average attack of acute inflammation of the ap-

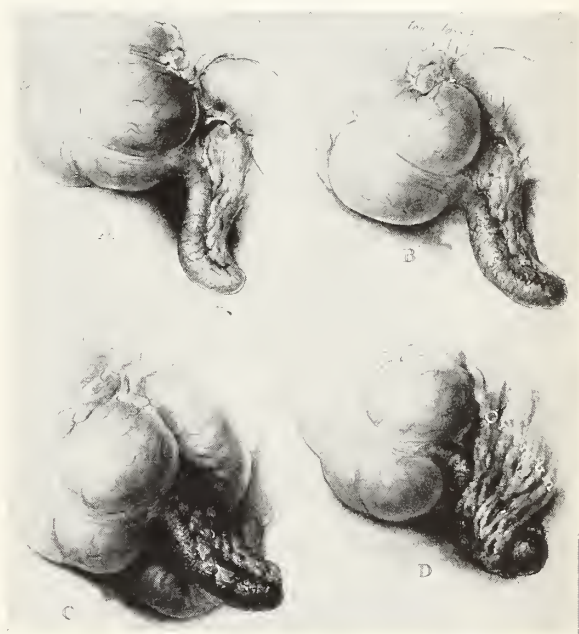


Fig. 1. Localized Mass. The inflammatory mass may be an acute catarrhal, ulcerative, suppurative, or gangrenous. The removal of any of these will result in cure. Because of catastrophic deaths the chances of dying are one in 169.

pendix is so small that antitoxin appears in the blood serum in only 22 per cent of instances; but following perforation, antigen in larger amounts is absorbed, and if the patient lives, antitoxin is found in the blood serum of over 70 per cent of instances. Another important reason for withholding drains in the non-perforative cases is that complications, such as peritoneal infections, resulting in fecal fistulas and intestinal obstruction occur more frequently and the morbidity and mortality are increased over the non-drained cases.

In seventy-one hospitals of the 181 surveyed, 118 operators did not drain the peritoneal cavity following removal of a perforated appendix in 126 patients and seventy-four, or 58.73 per cent, died.

Those who have not instituted drainage of the peritoneal cavity in the presence of a perforated

*See Clinical-Pathological Classification. Am. Jour. Surg., 45: 66, (July) 1939.

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE XVII. APPENDICITIS-PERITONITIS CLOSED WITHOUT DRAINAGE

	No. of Surgeons	No. of Patients	No. of Deaths	Mortality Per Cent
Acute Intact, Ruptured on Removal.....	32	37	36	97.27
Spreading Peritonitis.....	34	35	24	68.57
Localizing Process.....	35	36	14	38.89
Abscess.....	17	18	0	0.00
	118	126	74	58.73

appendix or following its removal have, undoubtedly, read or heard of some operator advocating this procedure. They justify themselves by reasoning that appendices rupture and abscesses develop which are absorbed. It is true that this is not uncommon, but such patients recover not so much because pus is absorbed, but because toxins are absorbed slowly. Nature accomplishes this by the formation of a pyogenic membrane within the wall of which microorganisms become attenuated. Monomicrobial infections of the peritoneum are the most virulent and do not tend to localize or form this protective membrane. Fortunately, in the majority of instances, more than one organism is responsible for the peritonitis secondary to acute perforative appendicitis. In over 90 per cent of instances, the infection is not only polymicrobial but both anaerobes and aerobes are present. It is possible that this is responsible for the low virulences of the microorganisms present in the appendiceal abscess, simple drainage of which rarely results in death.

Table XVII shows the number of patients and deaths with the percentage mortality of those operated upon for intact appendices which ruptured on removal but were not drained; patients operated upon for spreading peritonitis; the localizing process, and abscess.

There is no operation for lesions involving organs within the peritoneal cavity of man, in which streamlined-brain-management pays as high dividends in deaths as operation for the distended appendix which ruptures on removal where the operator closes the wound without drainage. The mortality is high because of the rapid absorption of virulent antigen.

The percentage mortality of each of the lesions in Table XVII diminishes with the development of local and general immunity.

Approximately 11 per cent of the 1,705 surgeons failed to place or failed to leave out drains in the peritoneal cavity when the diametrically

opposed procedure was indicated. This observation is in part responsible for the term "appendicitis-peritonitis." It is used to describe the peritonitis following rupture of the appendix and does not refer to the peritoneal reaction preceding perforation, which results in the extravasation of serous, mucoserous or serosanguinous fluids. The other reason for this term is that surgeons have camouflaged their spreading peritonitis mortality under the so-called acute appendicitis mortality. The mortality of the twelve councilor districts of Pennsylvania shows how this may occur.

The mortality of acute appendicitis and spreading peritonitis in Councilor District No. 1 is low. Councilor District No. 12 ranks second in appendiceal but eighth in spreading peritonitis mortality. Table XVIII is interesting in showing the results of the prophylactic campaign. The mortality is highest in those districts where the high schools have not received the educational talks.

The rupture of a membrane several microns in thickness is responsible for the high mortality. The percentage mortality depends upon when and how this membrane is ruptured.

The hyperacute perforative group shows what happens when perforations occur early and are accompanied by peritoneal trauma. Fifty-eight patients, average age 25, normal health, abdominal pain, death in 216 hours—tragedy condensed in 14 words. That twelve of the seventy operated upon lived, that 80 per cent of those that died received laxatives, that everyone did his utmost to save those that died must be remembered. But if surgeons responsible for these patients' lives are to profit, then we must not forget that while these patients had every reason to live—average age twenty-four, average temperature 100, average pulse 104—they were operated on forty-eight hours after onset of symptoms and every one of the seventy appendices ruptured on removal.

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE XVIII. COMPARISON OF MORTALITY BY DISTRICTS

Councilor District	Population	Students	Appendicitis Mortality			Spreading Peritonitis Mortality		
			Cases	Deaths	Mortality %	Cases	Deaths	Mortality %
1	2,497,029	132,796	5,084	122	2.39	711	116	16.32
12	613,650	45,966	1,534	42	2.73	136	39	28.67
2	627,966	37,420	1,514	44	2.91	185	40	21.62
7	231,306	15,434	581	17	2.93	51	12	23.52
6	366,542	26,483	895	27	3.02	115	26	22.61
11	766,330	51,857	1,159	36	3.11	137	35	25.54
4	446,165	29,494	1,250	43	3.44	77	38	49.35
8	439,303	31,124	898	33	3.67	106	28	26.42
9	385,044	25,611	647	24	3.71	40	22	55.00
3	543,890	36,546	1,219	48	3.94	158	41	25.94
5	797,700	50,825	1,439	66	4.58	168	60	35.71
10	1,916,425	147,737	3,178	156	4.91	458	151	32.96
Totals	9,631,350	631,293	19,398	658	3.39*	2,342	608	25.96**

*3.39 is misleading because it includes the deaths due to peritonitis.

**25.96 is definite—it shows what has happened to 608 of the 2,342 patients who developed a spreading inflammatory process of the peritoneum.

TABLE XIX. HYPERACUTE PERFORATIONS—INDUCED SPREADING PERITONITIS

TOTAL			AVERAGE				
No. of Patients	Deaths	Mortality Per Cent	Age	On Admission		Onset Symptoms to Operation	Operation to Death
				Temp.	Pulse		
70	58	82.86	24	100	104	48 hrs.	168 hrs.

TABLE XX. THE SPREADING PROCESS

TOTAL			AVERAGE				
No. of Patients	Deaths	Mortality Per Cent	Age	On Admission		Onset Symptoms to Operation	Operation to Death
				Temp.	Pulse		
1,118	26	24.06	22	101.4	118	69 hrs.	144 hrs.

This group of patients is unique, not only because of the startling death rate, 82.86 per cent, but never before, to the writer's knowledge, has it been possible to analyze and report at one time so large a number of cases where the period of time between perforation and death has been accurately recorded. The abstracts tell exactly when, how, and why perforation occurred in these seventy cases. Rupture occurred on an average of forty-eight hours after onset of symptoms. Some of them ruptured as delivery was almost completed. Most of these patients recovered; only the peritoneum adjacent to the incision became infected. The majority, however, were ruptured in the peritoneal cavity in various locations. The appendix was frequently abnormally situated and difficult to locate because of poor visibility.

Without exception, the peritoneum was literally prepared for the rapid absorption of toxins. Every move of the surgeon's hand was attended by trauma or death of endothelial cells with consequent exposure of lymph and arterial capillaries.

The average time between perforation and death was 168 hours. Some patients died so quickly that their abdominal walls were rigid at death. Distention, the usual accompaniment of the spreading peritonitis deaths, did not have time to develop. Most of them developed hyperpyrexia almost immediately after operation, and an uncountable pulse within forty-eight hours. Many of them never regained consciousness after operation and died in a toxic delirium.

These patients were operated on twenty-nine hours earlier and died seventy-two hours sooner

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE XXI. THE LOCALIZING PROCESS

TOTAL			AVERAGE				
No. of Patients	Deaths	Mortality Per Cent	Age	On Admission		Onset Symptoms to Operation	Operation to Death
				Temp.	Pulse		
1,154	281	24.35	30	99.7	100	98 hrs.	216 hrs.

The acute perforation which results in fulminating peritonitis within four to twelve hours after onset of symptoms is not common. The subacute perforation, however, occurs frequently. More than twenty-four hours usually elapse between onset of symptoms and perforation. During this time—the preperforative state—the cells in the tissues in proximity to the potential perforative site undergo changes which are protective. This is local tissue immunity.

In all, 1,118 patients, average age twenty-two, were operated upon sixty-nine hours after onset of symptoms with a temperature of 101.4, pulse 118, and 269, or 24.6 per cent, died on an average of 213 hours after onset of symptoms.

Of the 658 deaths, 621 were the result of spreading peritonitis. The records show that fifty-eight of these 621 were induced at operation—hyperacute group. What about the others? Let us consider the localizing process.

Of the 19,398 cases, 1,154 were admitted with subacute perforations — localizing processes. These 1,154 patients, average age of thirty, were operated on ninety-eight hours after onset of symptoms with an average temperature of 99.7 and a pulse of 100, and 281, or 24.35%, died 314 hours after onset of symptoms.

Why should the mortality of this process be as high as that of the spreading process? Because of time of operation and what the surgeon did at operation. Time as it relates to the out-

Fig. 2. *Localizing Process*. The localizing process, the spreading process, the localized mass are stages of a peri-appendiceal inflammatory process. All inflammatory processes of the peritoneum following rupture of an appendix are primarily spreading. As soon as the serous coat becomes devitalized permitting egress of microorganisms and their toxins, the contiguous peritoneum becomes involved. If the perforation is not large and laxatives have not been administered, the protective mechanism attempts to close the perforation by plastic exudate, omentum or intestine. This is the localizing process. When operated upon the localizing process is converted into a spreading process and one in four dies.

than those with the localizing process. Why? Because the vulcanizing plastic-lymph patch was blown off or the cemented intestine or omentum was detached by laxative induced peristalsis.

TABLE XXII. CLINICAL PATHOLOGY CLASSIFICATION—MORTALITY

Pathology at Operation	Number of Cases	Per Cent of Cases	Number of Deaths	Per Cent Mortality
Localized Mass	16,046	82.72	95	.06
Spreading Process	1,118	5.76	269	24.06
Localizing Process	1,154	5.95	281	24.35 ?
Localized Process	1,080	5.57	13	1.20
	19,398	100.00	658	3.39

ACUTE PERFORATIVE APPENDICITIS—BOWER

TABLE XXIII. THE LOCALIZED ABSCESS

TOTAL			AVERAGE				
No. of Patients	No. of Deaths	Mortality Per Cent	Age	On Admission		Onset Symptoms to Operation	Operation to Death
				Temp.	Pulse		
1,080	13	1.20	30	100.1	99	123 hrs.	235 hrs.

come of these patients will be considered under antigen—antitoxin and appendicitis. How, “what was done at operation” affects the mortality is shown in Table XXII. Has surgery failed in its purpose if individuals aged twenty-seven, with temperature of 100.2 and a pulse of 99, die after operation? Was something done which should not have been done at operation?

Does the explanation graphically shown in Table XXII seem reasonable?

The localizing process can develop into a spreading process or a localized abscess. A large percentage of localized abscesses were previously localizing processes. The mortality in the 1,080 with localized abscesses is 1.20 per cent, or one in eighty-three. *When appendices are removed in the presence of a localizing process the mortality is the same as the spreading process—one in four.*

How many of these 281 deaths were induced? The majority of these patients died with hyperpyrexia, tachycardia and distention, much the same as the hyperacute, except that delirium was less frequent and they lived forty-eight hours longer after operation.

Did time of operation and what was done at operation have anything to do with these patients' deaths? Is there any significance attached to the fact that both in the localizing and spreading group the mortality is one in four?

In the localized process group, 1,080 patients, average age thirty, were admitted to hospitals with an average temperature of 100.1 and pulse of 99, and thirteen, or 1.02 per cent, died. Those that died lived 235 hours (almost ten days) after operation.

From the standpoint of mortality this group approximates more closely than any other the acute intact group. There are comments and criticisms that can be made regarding the thirteen deaths, but we believe the surgeons who read this report will profit more by a comparative study of the results obtained in the management of 345



Fig. 3. Localized Process. The localized process—the appendiceal abscess—the end-result of the localizing or the spreading process; one in eighty-three die.

surgeons operating in Philadelphia, and 1,705 in Pennsylvania.

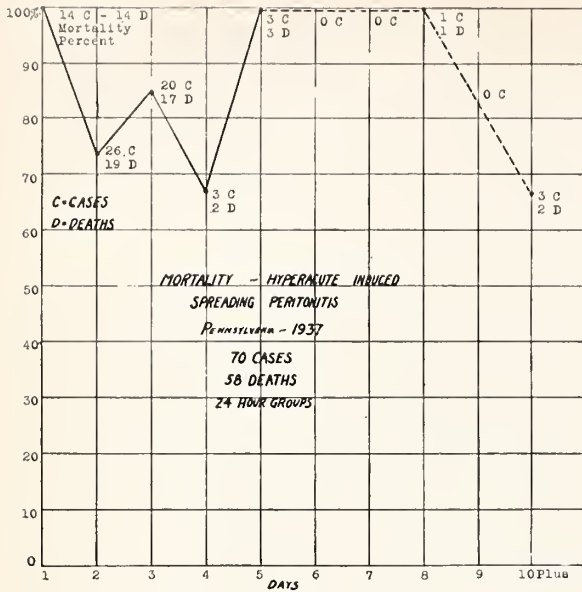
Table XXIV is shown to illustrate the improvement in management of this group of cases; the higher mortality in the State group is due in part to the greater number of catastrophes.

TABLE XXIV. APPENDICEAL ABSCESS

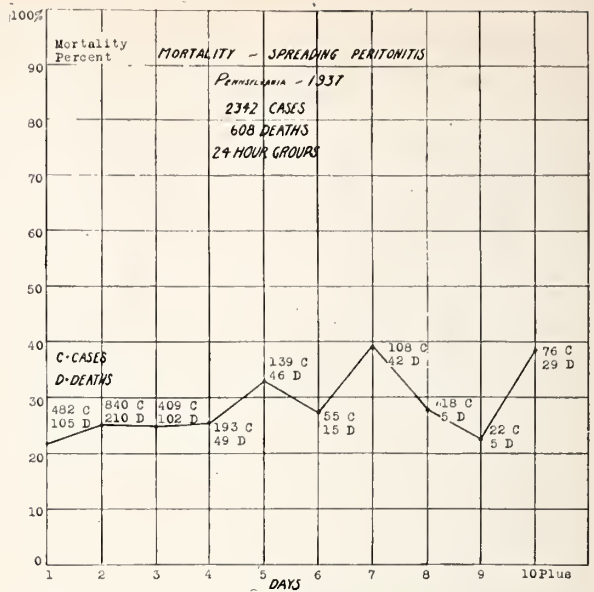
	Year	No. of Cases	No. of Deaths	Mortality Per Cent
Philadelphia	1928-29	1,502	57	3.79
	1930	625	11	1.76
	1931	618	10	1.62
	1932	572	5	.87
	1933	538	5	.93
	1937	458	3	.65
Pennsylvania	1937	1,080	13	1.20

Table XXV contains data which summarize the active and potential factors responsible for the appendicitis-peritonitis deaths.

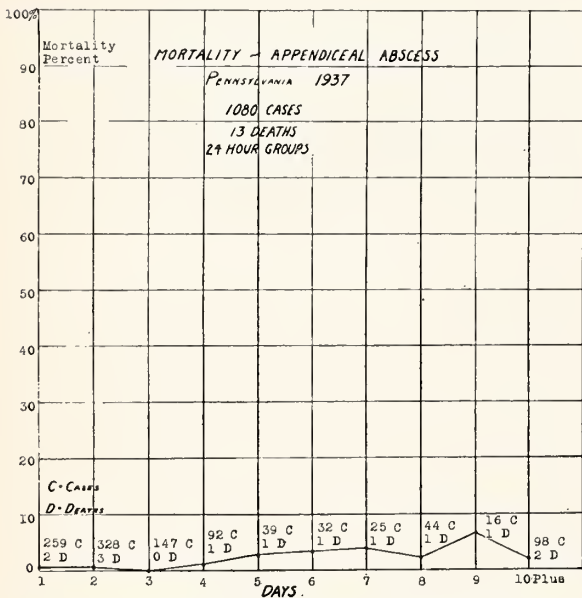
ACUTE PERFORATIVE APPENDICITIS—BOWER



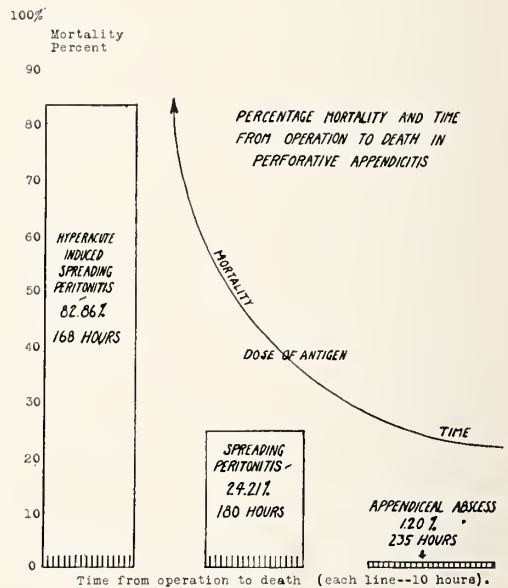
Graph 1.—Hyperacute Spreading Peritonitis. Before immunologic processes had developed, a large amount of antigen was projected into the peritoneal cavity—purulent distended appendices were ruptured at operation.



Graph 2.—Spreading Peritonitis. Immunologic processes are in the early stages of development—operative procedures 83.73 hours after admission.



Graph 3.—Appendiceal Abscess. Nature—patient's resistance—immunity is permitted to develop almost to its maximum—surgery is instituted after 123 hours.



Graph 4.

A summary of each of the four groups with comments has been presented. The problem at hand is the presentation of factors influencing the mortality which are common to all four groups. The writer is convinced that man is provided with but one system of defense against microorganismal invasion, that patients recover from spreading peritonitis following a perforated appendix in the same manner that they recover

from a pneumonia or a typhoid fever. This is the premise on which the following rests. This conclusion was arrived at before it was realized that the answer to the query, "why do some patients live, and others die, of spreading peritonitis?"—probably awaits those who are interested in the science of immunology.

It has been shown by animal experimentation by many investigators, and it is demonstrated

DISEASE OF THE CORONARY ARTERIES—WHITE

TABLE XXV. APPENDICITIS-PERITONITIS

	TOTAL			AVERAGE				
	No. of Cases	No. of Deaths	Mortality Per Cent	Age	On Admission		Onset Symptoms to Oper. Hours	Operation to Death Hours
					Temp.	Pulse		
Hyperacute Induced Spreading Peritonitis	70	58	82.86	24	100	104	48	168
Spreading Peritonitis	1,118	269	24.06	22	101.4	118	69	144
Localizing Induced Spreading Peritonitis	1,154	281	24.35	30	99.7	100	98	216
Appendiceal Abscess	1,080	13	1.20	30	100.1	99	123	235

here, that absorption is increased in acute inflammation of the peritoneum. As the process diminishes in severity, absorption is diminished. *Time is an important factor.*

Microorganisms and their toxins vary markedly in virulence, but attenuation does occur as emphasized in the following: the highest mortality occurred in the group admitted within 48 hours (Graph 1), the second highest in those admitted within 83.73 hours (Graph 2), and the lowest occurred in the group admitted in an average time of 123 hours (Graph 3). Again, *time is an important factor.*

Time is also important in "what the surgeon does at operation." Is it necessary for him to hurry? The average time that has elapsed before admission to the hospital in the appendicitis-peritonitis group is forty-eight hours. The patient is one of the best surgical risks. Is it not best to make haste slowly?

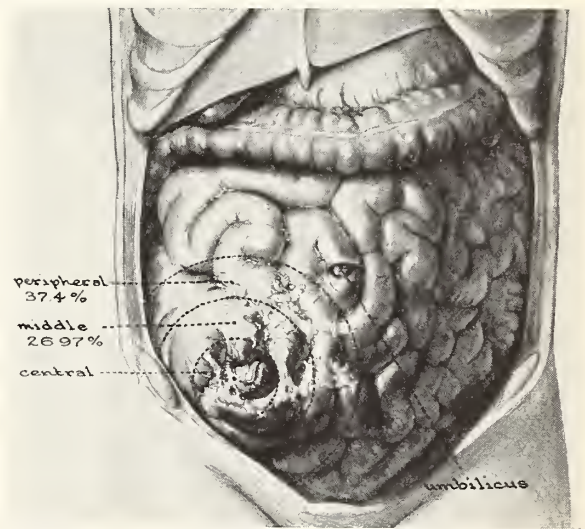


Fig. 4. *Spreading Process.* This is the spreading process. While the localizing process is regressing when operated upon, the spreading process is progressing. The mortality in this group is dependent upon the resistance of the patient, the time of operation, and what is done at operation.

DIAGNOSIS OF DISEASE OF THE CORONARY ARTERIES*

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NO attempt is made here to consider systematically all the factors in determining whether or not the coronary arteries are diseased. While this is important, it is still more worth while to determine by examination the nature and circumstance of the disease condition as a whole, which is in truth the diagnosis.

Until or unless pathological changes in the coronary arteries cause impairment of the cir-

culatation in the myocardium, such pathologic changes are not recognizable during life. A single exception might be made in those rare cases where the fluoroscope or x-ray film have given evidence of calcification in the heart wall distinguishable from the calcification occurring in the aortic or mitral valve. Even this isolated type of demonstration is relatively insignificant because almost without exception when an atheromatous area is so far advanced as to give demonstrable areas of calcification, there is already impairment

*Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 23, 1940.

of circulation in the myocardium beyond the point of calcification in the vessel wall.

For practical purposes then, it may be stated that the importance of coronary artery disease lies in its effect upon the myocardium and further that it is the effect upon the myocardium which we recognize, while the part played by the coronary arteries is largely a matter of inference. In other words, the true diagnosis from the clinical standpoint relates to the nature and circumstances of the disease condition in the heart muscle, and let us here include its conduction paths. We may infer the cause to lie in conditions in the blood vessels. Circumstantial evidence may make the inference valid.

It is necessary to consider, though with the utmost brevity, certain facts in the physiology and pathology of the coronary arteries, with particular attention to what is now known concerning the existence of anastomoses in these vessels and the possibilities in the development of collateral circulation.

The concept of Cohnheim, published in 1881, that the coronaries are end-arteries has been almost universally discarded. The work of Lewis Gross in 1921, of Spalteholz in 1924 and of Campbell in 1929 has been strikingly suggestive of the development of an increased anastomotic circulation with increasing age. Throughout all the discussions the suggestion of the importance of the Thebesian circulation has been heard, but it seems quite clear that this circulation is not of major importance, at least in the muscle areas which constitute the wall of the left ventricle and the interventricular septum.

It has been held for many years that the existence of anastomoses and the development of collateral circulation are the most important factors in the favorable response made by many individuals, even in the presence of more or less extensive, sometimes severe and acute, obstructions in the coronary arteries. It is probable that there is a wide difference in individuals in the extent of the anastomoses existing originally and in the capacity for the development of collateral circulation. The evidence of such suggested collateral circulation has not been readily secured. However, Blumgart, Schlesinger and Davis¹ have recently published the best planned study of collateral and anastomotic circulation in the heart to date. Their demonstration of extensive anastomoses in the heart with occlusions in coronary

vessels is complete. In their conclusions they state that anastomotic circulation develops when and where it is needed, and that the development of such anastomoses is not related to age, for they are not present even in the hearts of senile patients when little or no coronary arteriosclerosis is present.

That obstruction in a coronary artery can cause damage up to and including actual tissue death, i.e., infarction, in the myocardium has long been known. In such a case this means, of course, that any collateral circulation which might be present at the time of the occlusion is inadequate. On the other hand, extensive and often multiple obstruction may be found without gross evidences of infarction, and the puzzle has been in the past to determine what underlies these extraordinary differences noted. The work of Blumgart and his associates goes far towards clarifying our concepts in this field.

In the management of the disorders dependent on disturbances in the coronary circulation the clinician has long been impressed with the part which time plays in the progress of the patient in whom evidences of myocardial damage have developed. Under favorable conditions of rest and with time and more time and still more time, each observer has seen cases of angina pectoris improve to the point of disappearance for a time at least, of the syndrome; has seen cases of myocardial infarction surviving the acute phase, return to more or less, and at times surprising, capacity; has seen remarkable improvement in the congestive failure group, though here as a rule the results are not so striking; and lastly may see sometimes favorable progress in those cases in which the chief expression of myocardial damage is through changes in conduction and in rate and rhythm of the heart.

For the clinician several problems present themselves. Such problems are:

1. Under what circumstances may the most effective collateral circulation develop?
2. How long a time is required for the maximum development?
3. How can the presence of effective collateral circulation be surmised or proved?
4. What methods of therapy and management, if any, will aid in the development of the desired adjustments?

These questions are not posed in order to ef-

fect an answer. When they are set before one in the study of a case they provide a stimulus for a more effective and useful appraisal.

The factors most important in the development of collateral circulation in the heart wall are as yet not clearly evident. Two factors, however, play the largest part.

The first of these is the individual variation. There is no opportunity to study this clinically and we can only surmise that it plays a part in the survival of one individual while another with an apparently similar lesion may succumb. The second factor is the element of time. It is important for us to study this factor because in the past we have relied upon it not knowing exactly why. Unfortunately we cannot see the processes of development of collateral circulation during life in the heart wall and can only estimate their presence by indirect evidence. A somewhat analogous situation, however, can be studied visually during life when there is an obstruction in the external iliac or the femoral vein on one side. Careful observation of the entire venous circuit visible over the upper thigh and lower abdomen in such cases shows venous dilatation in the collateral area very early, but the establishment of the maximum dilatation of the collateral veins and relief of the circulatory embarrassment takes many months and in some instances is not complete until two or three, and occasionally even more, years have elapsed.

Whether the development of collateral channels in the coronary arteries is more rapid or less so than in the venous circulation cited, one does not know as yet. It would not be surprising if the thicker, more resistant walls of arteries took longer for the development of the effective dilatations and anastomoses.

Until a sufficient series of well studied autopsy specimens can be secured in cases with authenticated dating of occlusion, we must rely upon clinical impressions. My tentative conclusion, based on the study of favorable progress in many cases of coronary occlusion and of angina pectoris, is that the full development of collateral circulation in the coronary arteries takes many months, a year or two and sometimes more.

After a myocardial infarction is demonstrated, it is seldom that an informed physician today will require less than two months, and will demand often more, before any activities whatever are allowed. If then symptoms or signs of cir-

culatory embarrassment develop, it is usual that many more weeks and even months of relative quiet will be required.

Emphasis is placed upon the subject of the collateral circulation when considering diagnosis because it is the estimate of this collateral circulation and its effectiveness which plays a most important part in management. The diagnosis of the existence of circulatory inadequacy is not enough. An appraisal of the progress of compensation is essential. The realization is growing that this progress is in good part dependent upon compensatory collateral circulation.

There are four great groups of phenomena dependent on impairment of circulation in the myocardium and due to changes in the coronary arteries. These groups are: (1) The angina pectoris syndrome; (2) myocardial infarction; (3) myocardial damage with "congestive failure"; and (4) myocardial damage with changes in conduction and in rate and rhythm of the heart.

In many cases one or more groups of these phenomena are combined in the single individual. These combinations may be helpful in suggesting and in recognizing the vascular origin of the lesion. Time does not permit of a systematic study of the diagnostic features but a few remarks may be in order.

The angina pectoris syndrome when occurring without manifestations of any of the three other groups will at times present one of the most difficult diagnostic problems in medicine. This is particularly true when the economic problems of compensation and disability benefits are involved. The purely subjective character of the evidence in at least one-fourth of the cases will at times call for the greatest acumen and experience with even then the true answer not always immediately at hand. Some patients are unable to express themselves adequately and others may be so glib and well versed in a recital of typical symptoms as to arouse suspicion. Genuine differences of opinion between honest observers can thus develop. The credibility of a witness does not always impress itself alike upon all hearers. When to the subjective is added objective evidence, such as changes in heart size and in the electrocardiogram, the difficulties in diagnosis may disappear.

Although myocardial infarction has been receiving increasing attention since the publications

of J. B. Herrick beginning in 1912, it is still, I think, a condition which does not receive adequate attention by the majority of physicians. In my opinion the interests of the patient demand that whenever suggestive symptoms occur a careful continuing persistent study should be instituted promptly and this in satisfactory surroundings so that the question can be definitely answered: Is there in this case actual necrosis of tissue, i.e., definite myocardial infarction? To do that it is necessary to obtain evidence along all possible lines and to differentiate clearly from several conditions which may at times simulate it. It is not sufficient to acquire one or two lines of evidence but several must be studied, including a study for fever, leukocytosis, acceleration of sedimentation rate of red blood corpuscles, significant changes in blood pressure, signs of localized pericarditis or evidences of intraventricular or intra-auricular thrombosis, as shown at one time or another by embolism. Disturbances of rate and rhythm and the significant changes in the electrocardiogram are considered in another paper in this symposium. Later on in the case

studies for the development of mural aneurysm with or without calcification are in order.

The importance of all this study in suspected myocardial infarction lies in this: That if a true infarct has developed and the patient survives the immediate event, a long, painstaking and studiously supervised period of rehabilitation is in order. The aim during this period of rehabilitation is to guide the patient with the greatest efficiency so that the proper combination of rest and time may be given to induce the development of the most effective collateral circulation possible. If it has been possible to stimulate a more intensive study of the angina pectoris syndrome and of myocardial infarction, the purpose of this paper will have been accomplished. The congestive failure group will be presented elsewhere and the electrocardiographic studies are considered by another participant in this symposium.

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CORONARY DISEASE—ITS TREATMENT*

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THE "treatment of coronary disease" to the medical mind suggests the treatment of angina pectoris and coronary occlusion. For the sake of brevity and to limit the discussion to this most frequent phase of coronary disease, I shall not discuss the therapy of the various effects of coronary sclerosis on the myocardium of a more chronic nature, with or without heart failure. Naturally, some of the measures used in the treatment of the various manifestations of coronary disease overlap, but I shall restrict myself to the consideration of the treatment of angina pectoris and coronary occlusion.

Coronary Disease with Angina Pectoris

Angina pectoris is a functional state, and may be due to several causes, among them relative conditions of myocardial anoxemia due to par-

oxysmal tachycardia, hyperthyroidism or anemia; and due, in coronary sclerosis, to a diminished, quantitative supply.

Once the symptoms of angina pectoris are noted, certain therapeutic measures must be immediately instituted. If the anginal symptoms are in relation to an anemia, treatment must be directed to its cause. Thyroidectomy will relieve patients who have anginal symptoms in association with hyperthyroidism. Paroxysmal tachycardia related to hyperthyroidism can also be relieved by surgery. If due to other causes, quinidine is usually helpful. Syphilitic lesions affecting the coronary ostia in such a way as to diminish the blood supply to the myocardium must be treated with anti-syphilitic measures, preferably a milder non-reactivating agent.

Certain general measures are advisable in the treatment of angina pectoris with coronary sclerosis. Of these measures rest is by all means the

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most important; restricted to bed rest, if pain is provoked on the slightest exertion or allowed to an extent and degree consistent with the patient's limited tolerance to exercise. Coöperation with the patient in eliciting the degree of tolerance usually enables one to arrive at a safe procedure. Patients may note how long a distance they may walk on the level before pain is induced, and how soon the pain response is developed by climbing stairs or walking uphill. It is emphasized to the patient that he must learn to keep his activities below the threshold which causes pain, and if pain comes on with any activity he must immediately discontinue such corresponding effort until pain no longer is initiated. As the condition of the patient appears to improve the amount of exercise indulged in may be prolonged gradually, until a fair or adequate compensation is arrived at.

Excitement and worry act similarly in inciting attacks, by accelerating the heart action and augmenting its work. The patient must be cautioned to avoid, when possible, situations which tend to excite him too much—quarrels, sad situations, watching or listening to the recital of athletic contests over the radio, etc. Many patients fail to recognize the influence of intercourse in affecting angina or coronary occlusive symptoms. Relinquishing a job because of anginal symptoms is a subject, however, that must be thought over very carefully before decided upon, because of the many personal economic and social factors which interplay. If the patient is overweight, weight reduction is undertaken. Since the patient cannot reduce by increasing his exercise, dietary management is oftentimes our only recourse. Weight reduction should be accomplished gradually and consistently rather than to enforce too marked a nutritional deficiency with the hazards of an avitaminosis added.

The consensus seems to be that tobacco should be avoided, and its indictment seems to be founded on a clinical and experimental basis. Compromising with the patient to reduce the amount of smoking is usually ineffective, and complete abstention should be insisted upon. Alcohol in medicinal doses apparently is of benefit in promoting vasodilatation, but should be used in medicinal proportions and not in excessively stimulating amounts. Kerr has suggested the use of a belt for support of the abdomen, so as to facilitate diaphragmatic function and respiratory ef-

iciency. In a very limited experience its use has been satisfactory, and apparently pleasing to the patient.

Medicinal Treatment.—Whiskey has already been mentioned as of value. The nitrites have been found most useful in relieving attacks of angina pectoris, and according to several clinicians, have also been used to prevent attacks with evident success, administered just before effort. Nitroglycerine tablets dissolved under the tongue or crunched between the teeth, and thoroughly dissolved, in doses of 1/100 gr., seem to be the most effective method of use. Amyl nitrite is satisfactory, but less easy to handle, and because of its odor, conspicuous in its use. Recently, inhalers containing octyl nitrite have been advised as beneficial. The routine use of the nitrites is of doubtful value.

The xanthine derivatives have been widely used in routine practice, and good results reported in a large percentage of cases. There is, by no means, universal agreement among writers, however, as to the relative merits of this group or various members of the group, some preferring theobromine compounds, others theophylline preparations. These drugs may be used for a long period of time unattended by any ill effects. I believe there is a tendency to use xanthine derivatives in too small doses. Recently, Clerc and Sterne¹ drew attention to a group of substances influencing anginal crises, which unite the antifibrillatory properties of quinic substances, and the beneficial effect of theophylline on the coronaries. It is known as 1262-F, the diethylaminoethoxydiphenyl, and is administered by mouth, up to daily amounts of 0.15 to 0.2 gms.

Many patients with anginal symptoms are nervous and high-strung, and even in the more calm, mild sedatives are frequently advantageous. For the simple nervous situation, bromides or the barbiturates are sufficient. With more active pain, codeine may be used. In 1939, Master, Jaffe and Dack² made a study of sixteen drugs, including a placebo, namely, milk sugar, on angina pectoris, to note evidences of any specific effect on the anginal syndrome. They included several xanthine derivatives, alcohol, sedatives such as phenobarbital, chloral and bromide, the nitrites, tissue extracts, digitalis, and two narcotics, codeine and dilaudid. Some patients were helped by all the drugs; others by none. No

drug was consistently successful in a significant number of cases, and equally satisfactory results were obtained with the use of the placebo as with the supposedly more active drugs. The writers believe that much of the benefit is derived from psychologic factors and a reduction in the emotional status. Their observations do not apply, of course, to the acute attacks. Long clinical experience, I think, tends to support the view of these writers, at least, in part. The value of routine medication must not be over-estimated.

I believe there is little basis from the standpoint of clinical results as far as the use of tissue extracts is concerned. In certain instances the exhibition of sedatives, xanthine derivatives, nitrites or alcohol seems beneficial; in others not. The choice of the agent used and the duration of its administration must depend upon the personal desires and choice of the physician. Personally, I am inclined to the use of small doses of sedatives, with one of the xanthine derivatives, and frequently, alcohol in proper doses.

In the hands of a few, the surgical treatment of angina pectoris has been highly extolled. On experimental evidence, and occasionally in humans, good results are reported by such men as Beck, O'Shaughnessy, and others. The basis of the procedure is an effort to promote collateral circulation to the myocardium by the use of adjacent normal tissue, such as muscle or the omentum. Such procedures are not within the province of this discussion, and not recommended at this time for general practice. Thyroidectomy, as first advised by Levine, is apparently justifiably falling into disfavor. In some instances, where the patient's anginal symptoms are frequent and difficult to relieve, even with a most careful regimen, peravertebral alcohol injections may be used. They are not unattended with danger, and should be used only by the experienced, and with due caution. In ideal circumstances, the results are good, but it is to be borne in mind that though the pain discomfort may be diminished, the pathologic process, which is the basis of the disease, is not altered.

Treatment of Coronary Occlusion

The first consideration in the treatment of patients with coronary occlusion is the relief of pain and shock. The latter varies considerably in its degree, but one can never tell when the physiologic mechanism of the heart may be interrupt-

ed and death result, even in the absence of shock. Hence, rest (using the term in a broad sense) is an imperative therapeutic necessity. If the patient's condition is critical it may be injudicious to move him, unless the attack comes on in the street or in a shop. Oftentimes, it is best not to disturb him by undressing him except for his outer clothing. If the patient breathes more easily in the semi-upright position the body should be adequately supported by pillows. Effort should be made to keep the body warm. Occasionally in syncopal attacks the head may be kept flat. No one should be allowed in the room except the immediate attendants. The alarmed relatives should be in the background. These measures suffice for the immediate situation. Morphine is the best remedy for the relief of the excruciating, wearing-down pain. In vigorous persons $\frac{1}{2}$ gr. morphine sulfate by hypodermic, or $\frac{1}{4}$ gr. by the venous route is not excessive, even with due regard to certain unfavorable after-effects, as for example, vomiting and respiratory depression. Vomiting is so commonly associated with severe attacks that one is not justified in always blaming morphine for its occurrence. I see no great advantage in substitutes, such as dilaudid or pantopon. If the patient's resistance to pain seems to be good, or the attacks associated with less pain, smaller doses of morphine may be sufficient. It is my belief, however, that pain, combined with shock, is so distressing to the patient that its relief should be occasioned as rapidly as is consistent with safety. Atropine and/or papareline may be tried first or as accessories to morphine.

There is also evidence, as pointed out by Epfinger, that under the influence of morphine a smaller cardiac output is required, and the resultant diminution of work on the part of the heart may be of importance. Nitrites are of no value in acute coronary occlusion. Most physicians are inclined to give an initial dose in the hope that it may relieve what might be a simple anginal attack. An additional agent of undoubted benefit in the relief of the immediate attack when other measures fail, is the inhalation of oxygen in adequate percentage amounts. It is indicated in all cases where there is an increase in the pulse rate, respiratory rate, dyspnea, or cyanosis. Oxygen relieves all of these if the condition is not irreversible. It also tends to lessen pain, and is an adjuvant to the effect of morphine. Concentra-

tion should be at about 50 per cent, and because of the ease of its administration and the lack of physical annoyance, an oxygen tent is the better method, though the nasal catheter is of great benefit.

It is not necessary to give the patient any food for the first few hours after the attack, but fluids may be administered by mouth, preferably slowly, and with due regard to the likelihood of vomiting. Water (cold, if desired, or hot if the patient is in shock) in frequent small amounts is usually sufficient until the patient recovers from the initial shock. After this occurs it may be increased in amount to an optimal level, or even increased to 2 or 3 liters per day if the patient perspires excessively. If vomiting continues, physiological salt solution, with isotonic glucose, may be given subcutaneously slowly. This is much more satisfactory than the rectal drip, and less likely to be harmful at this stage than intravenous medication. The use of hypertonic glucose solution in one form or another (50 c.c. in 50 per cent solution, one to three times per day) is advised by some clinicians, on the basis of improving the myocardial nutrition. Theoretically, it might be considered of advantage, but I should consider an isotonic subcutaneous administration sufficient for the purpose if the patient is not able to take sugar by mouth, in the form of fruit juices, to which sugar may be added. In patients with pulmonary edema or passive congestion, I am inclined to its use in higher concentration. Because of the dehydrating effect of concentrated glucose solutions on the tissues, adequate water intake must be supplemented.

The function of the bowels may be maintained by giving an enema in from twenty-four to seventy-two hours, depending, on the one hand, upon the degree of shock, and on the other, the presence of abdominal distention, which may be relieved by such measures. Individual circumstances must help the clinician in making a decision, but insistence on having the bowels move once a day is, I believe, in most cases unnecessary. After the first few hours, food, in liquid form, may be administered, to be followed by semi-liquid preparations, such as cooked cereals, light puddings, pureed vegetables, soft eggs, et cetera, and later supplemented by articles of food which can be prepared by being well cooked and yet pleasing to the patient's palate. Just as it is important not to disturb the patient too much

physically by getting him on the bed pan frequently to permit of bowel function, it is equally important not to examine the patient too frequently by turning him over on his side or by raising him up in bed. There is no condition in which greater caution must be exercised in needlessly moving the patient about for the desire of a thorough examination of the lungs posteriorly, than in coronary occlusion.

After the treatment of the initial shock and the insistence upon absolute rest, the question of further safeguarding the patient's physical capacity and stamina must be considered. The question of bed rest requirements as far as duration of time is concerned is frequently brought up by the patient himself as he begins to improve. I do not believe that any patient should be allowed to get up in less than four weeks after a coronary occlusion, and oftentimes he must be kept in bed for a much longer period of time, depending upon various contingencies. A period of six weeks is the average. One is guided by certain clinical laboratory findings—the white blood count, differential blood count, and the sedimentation rate. The temperature curve and pulse rate and the character of the physical findings are also criteria for evaluation. No patient should be allowed to get up for one week after all evidences of activity, as manifested in one way or another, subside.

When the patient is allowed to get up it must be done in very gradual increments of time. It must be remembered that reclining in a chair is frequently no more burdensome than lying in bed, and probably less so. The hazard lies more particularly in the effort to transport him between the bed and the chair. From the time the patient takes his first step, the time and distance involved in exercise may gradually be increased, with small excursions about the room, to the bathroom (on the same floor), and as the patient improves, gradual descent and ascent of the stairs. In people of small stature and weight it frequently helps the morale considerably to carry the patient downstairs and up for a change of milieu. It is said that descending the stairs involves five times the physical exertion encountered in walking the same distance on the level, and ascending the stairs, fifteen times as much effort. This may be used as a rough criterion for an increase in effort. As soon as the patient is able to do so, short walks out of doors, or rid-

ing about in an automobile may be indulged in, future increases dependent upon the response to each added effort. It is needless to go into greater detail. The resumption of the patient's usual activities must also be gradual. When possible, a sojourn in warmer climes in the wintertime is of benefit, because of the lack of necessity of combating the severe element of climatic change. The patient should be safeguarded first in going outdoors in inclement weather, and the necessity for donning heavy clothing to combat the winter atmosphere should be avoided.

Medicinally, the patient may be given sedatives if his rest is disturbed, or if he is unduly apprehensive about his condition or his future. The barbiturates are effective, with no contraindication. Routine medication with the xanthine derivatives is a moot point, but is used by most clinicians for a few weeks to a few months, in the hope that it may increase the circulatory efficiency generally, as well as in the myocardium. Theophylline derivatives may be used in smaller doses, but as compared to the theobromine derivatives probably have no superiority, and may, in fact, be somewhat less efficient, when given by mouth. The use of quinidine as a preventive of ventricular fibrillation or other physiologic disasters may be helpful, but convincing evidence is lacking. If the patient presents premature ventricular contractions the indication is more definite. Three to 5 grains may be repeated three times a day.

The consensus is that digitalis should not be used except where indicated for reasons consistent with cardiotherapeutics in other conditions. If there is a fibrillation present and the rate increased, nothing is so effective and if the patient exhibits signs of stasis in the lungs or general circulatory insufficiency it may be used according to the same method as employed in heart disease due to other causes. When a threshold digitalization has been attained the dosage should be reduced to 1 or 1½ cat units per day.

Certain situations may arise as complications in coronary disease which demand other measures. In patients who are in shock and in whom the blood pressure is low, adrenalin may be of benefit. There may be some objection from the standpoint of physiologic experimentation, but clinically, in discussing the matter with other

cardiologists, they admit of certain clinical enthusiasm in regard to it. If the patient has pulmonary edema during or after the attack of occlusion, morphine is necessary; adrenalin may be used as well as aminophylline in 7½ gr. doses intravenously once or twice a day. Concentrated glucose preparations one to three times per day are indicated. Measures for the promotion of absolute rest must again be enjoined, in the event of such attacks occurring sometime after the actual occlusion.

In the patient with congestive heart failure digitalis is the sovereign remedy, combined with a reduction in the fluid intake, at the same time observing a record of the intake and output, and the use of diuretics. It is in these instances that the xanthine derivatives, given by mouth, are of benefit, and less disturbing to the digestive apparatus than corresponding large doses of the ammonium salts, etc. Mercupurin, salyrgan, esidrone, or any similar preparations, with or without theophylline, intravenously, two or three times a week, are of great benefit in relieving the patient, not only of the mechanical distress of the congestion, but also in yielding physiological relief. In patients who are in shock, the question of giving stimulants, such as coramine, caffeine, or strychnine, usually lies within the choice of the physician. Except as a gesture, I have relatively little faith in them.

I think there are a few points in the treatment of coronary occlusion that are needful of particular emphasis; namely, the insistence upon absolute physical and mental rest, and the sufficient administration of morphine and atropine and possibly oxygen in the early phases of the attacks; the need of keeping the patient quiet long enough so as to permit of anatomic restitution, at least in part, to the injured structure; and the avoidance of over-treatment of the patient by needless medical and nursing manipulation. Generally speaking, the patient, after the initial attack has been treated and overcome, should be permitted to coast along in his convalescence, until he is permitted to resume his activities gradually.

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THE ELECTROCARDIOGRAM IN CORONARY DISEASE*

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IN considering the electrocardiogram in coronary disease, I will not present lantern slides of typical and atypical tracings, and I will not explain the technicalities of the electrocardiograph itself, but limit my discussion with you to what you can expect to learn from an electrocardiographic tracing and what the limitations of this procedure may be.

In discussing this subject it is necessary that we first state briefly the fundamental facts regarding the electrocardiograph. The electrocardiograph is an instrument primarily concerned with furnishing evidence of the anatomical state of the heart muscle and of the coronary arteries, and in no way does it aid one in determining the functional capacity of the heart or its ability to do work. In the very small proportion of cases of cardiac irregularity, that cannot be differentiated clinically, the electrocardiograph can clarify the exact nature of such an irregularity. The electrocardiograph has almost no value in diagnosing valvular lesions.

The typical case of coronary occlusion can be diagnosed from the clinical picture alone and the electrocardiogram is needed only to localize the site of the infarction. In the atypical or questionable cases an electrocardiogram will often definitely decide the matter immediately, although at times when the clinical history and findings are inconclusive, serial records may be necessary to rule out or establish the diagnosis. It is imperative always to bear in mind the fact that occasionally all records may be within normal limits and yet the patient dies of coronary occlusion. This is usually in rapidly fatal cases where cardiographic changes do not have time to manifest themselves. It is well to reemphasize that serial records are not only very important in the diagnosis of coronary occlusion, but they also give a graphic picture of the course of the disease and thus make the most efficient management possible.

In the arteriosclerotic age group, serial electrocardiograms give an important picture of the ageing process in the coronary blood vessels and

may indicate changes long before there is any clinical evidence. Therefore, in systemic diseases in which heart disease of an arteriosclerotic nature is common, it is prudent to make periodic electrocardiographic records. The electrocardiogram correctly correlated with the clinical history and physical findings, materially aids in judging the progress of coronary disease.

Substernal pain and distress is one of the most serious problems confronting the private practitioner and the entire mode of life, economic position and happiness of the patient and his family depends upon a correct diagnosis. As we all know, chest pain is not always due to coronary disease or coronary insufficiency, and the electrocardiogram will often assist us in arriving at a diagnosis. Unfortunately electrocardiographic records are not always diagnostic. We all know that one can have organic heart disease with the pain due to other causes and that chest pain of cardiac origin does occur in some cases even in the absence of electrocardiographic abnormalities. Successive changes in the serial electrocardiogram is the most important diagnostic aid of electrocardiography and often the electrocardiograph is able to eliminate the heart as the source of symptoms suggestive of myocardial disturbance.

The electrocardiograph is a most useful instrument but routine electrocardiograms in the absence of clinical findings of heart disease, certainly are of no value to the clinician in arriving at a judgment of the condition of the heart.

All electrocardiographic records must be correlated with the clinical history and physical findings and the electrocardiogram of and by itself is not able to make a diagnosis or a prognosis for you. Owning and using an electrocardiograph involves more than just making a record—a twelve-year-old can do that after fifteen minutes' instruction. You must be willing to undertake sufficient study to enable you to make an intelligent interpretation of the records you secure and properly correlate them with the clinical findings, or in lieu of this, your records must be interpreted by a qualified person and in order that this

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interpretation may be of the utmost value, the interpreter must have a summary of the clinical history and physical findings.

Summary

1. The electrocardiograph definitely aids in the diagnosis and management of coronary disease and serial electrocardiograms are invaluable.

2. The electrocardiograph is only informative on the anatomical condition of the heart and in no way aids one in determining the functional capacity of the heart or its ability to do work and

it is of almost no value in the diagnosis of valvular defects.

3. The electrocardiograph may eliminate the heart as a source of symptoms suggestive of myocardial disturbance.

4. The interpretation of the electrocardiogram must be made by a thoroughly trained individual and the findings must be correlated with the clinical history and physical findings.

5. The electrocardiograph, of and by itself, cannot make the diagnosis and prognosis for you.

PNEUMOCONIOSIS*

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PNEUMOCONIOSIS is a generic term whose use at times has been attended with some confusion. It embraces the reactions of pulmonary tissue to industrial dusts, which in some instances present clear-cut diseased conditions; in others, conditions which are not entirely clear; and in still others, conditions which have little or no clinical significance. Much water has gone over the dam since attention was first called to the importance of dust exposure in industry as a cause of pulmonary disease. A little over thirty years ago, when the campaign against tuberculosis was well under way, the statisticians began to call attention to the fact that workmen in dusty trades had a consistently high death rate from tuberculosis. It was surmised that many kinds of dust, by virtue of their physical properties of hardness, sharpness, and insolubility, produced a mechanical injury of the lungs which paved the way for a tubercle infection. With respect to certain organic dusts which did not have physical properties calculated to injure the pulmonary tissue, it was felt that these probably acted as conveyors of the tubercle bacillus. This seemed a reasonable explanation for the excess mortality from tuberculosis observed among certain groups of textile workers, tobacco workers and leather workers.

Disability and a high mortality were so conspicuous in what was commonly termed the hard rock mining industry that it was but natural that

anti-tuberculosis workers should stimulate investigation of that type of underground work and the first clinical study of pulmonary dust disease was made about twenty-five years ago by the United States Public Health Service and the Bureau of Mines, to be quickly followed by others in various parts of the country. These early investigations were mostly confined to the mining industry, except for the studies made in the textile industry by a group of physicians in Philadelphia.

Investigations were made in industrial communities over long periods of time. This procedure offered the tremendous advantage of observation of industrial workers ranging from those new in the industry to those who had been employed for many years, and thus made possible a correlation between the symptoms they presented and the length of employment and the working conditions in various occupations in the same industry. There was gradually built up a comprehensive knowledge of the etiology of pulmonary dust disease which led to a clearer understanding and did away with many false preconceptions. The most conspicuous fact was that where workmen were exposed to dust containing free silica in large amounts, they contracted a definite and specific type of pulmonary fibrosis; that this fibrosis produced characteristic appearances on an x-ray film, and was accompanied by a consistent progressive clinical picture, in which dyspnea on exertion was the outstanding symptom.

It was learned in time that the symptoms pre-

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sented by any group of workmen bore a definite relationship to the severity of such silica exposure. In other words, the symptoms and progress of the disease were directly proportionate to the amount of silica which invaded the pulmonary tissue. It was conspicuously apparent that in communities where men were exposed to a severe silica hazard, the incidence of and mortality from tuberculosis was extremely high, in some instances so high as to be hardly credible. This tuberculosis mortality, however, was in sharp contrast with that of surrounding communities and even with that of the workers' families.

There was built up a concept of an occupational disease resulting from the inhalation of free silica dust, manifested primarily as a fibrosis evenly distributed throughout both lungs, which, dependent upon the circumstances of exposure to silica dust, would progress with the gradual development of disability. Secondly, especially where the silica damage to the lungs was of a considerable extent, tuberculous infection was apt to appear. Infection with the tubercle bacillus was more than merely a terminal episode and these two conditions reacted upon each other, definitely increased disability, and frequently led to a fatal termination. When death occurred as a result of pulmonary involvement in the great majority of cases, infection with the tubercle bacillus was present.

There came to my attention within the past month the report of the Miners' Phthisis Prevention Committee of Johannesburg, South Africa, for the three-year period 1935-1938. The authors summed up the experience of thirty years' study of silicosis in the gold mining industry and it was interesting to note how largely the observations concerning the etiology and clinical course of silicosis made in the early studies in this country had stood the test of time. Laboratory researches which have been carried on in this and other countries have modified our earlier ideas as to the manner in which silica affects the lung and have greatly increased our knowledge of the pathology of dust disease. Modern roentgenology has made possible early and accurate diagnosis and also has enabled the physician to watch the progress of affected individuals.

I might state here that organic dust has not been shown to produce a reaction of the pulmonary tissue and the pronouncement of Landis some twenty years ago that organic dusts played

no part in causing pulmonary fibrosis has held good.

Attention was naturally directed to other industries which involved exposure to dust containing silica in many forms—that is to say, combined silica—as well as exposure to other types of non-siliceous inorganic dust. Here investigators found that the picture of disability and disease seen among those exposed to free silica was conspicuously absent. Various terms such as chalicosis and siderosis fell into the discard and other designations, such as potters' rot, grinders' rot, miners' phthisis, and miners' consumption were found to relate to identical conditions and were supplanted by the term silicosis.

Field studies of various industries went hand in hand with animal experimentation in which were employed dusts similar to those found in industry. Animals were exposed to the inhalation of these dusts in specially prepared dusting chambers and Gardner, at the Saranac Laboratory, was the first to demonstrate silicosis in experimental animals. The method of intraperitoneal injection, with the technique of Miller and Sayers, was also used. The underlying motive for all this was to determine which industrial dusts were harmful, that is, would cause a pneumoconiosis of such a type or degree as to produce disability.

Among the dusts investigated both in industry and in the experimental laboratory were limestone, calcium carbonate, gypsum, cement, feldspar, soapstone, talc, precipitator ash, artificial abrasives, sericite and others. None of these, whether they contained silica in combined form or no silica, produced disease in animals, nor was evidence of disease found among workmen exposed to these dusts except in those instances where free silica was also present.* That the failure to find evidence of pulmonary disease among workmen was not due merely to lack of a sufficiently severe exposure was indicated by the uniformly negative results in animals where the conditions of exposure were known and controlled and similar to those of silica exposures. X-ray films of individuals exposed for a number of years to these inorganic dusts, which contained no free silica, may show peribronchial thickening or accentuation of the bronchial tree. The same appearance can be found in individuals who have never been employed in dusty industries. Occa-

*Talc is one exception. See U.S.P.H.S. study 1935.

sionally x-ray films of some of these workers will show a diffused haziness or increased density that might be construed as due to the action of dust. However, these workmen are healthy and neither symptoms nor disability can be ascribed to this x-ray appearance. Hence, my opening comment that pneumoconiosis, as a generic term, has a limited importance from a clinical standpoint.

Two specific and distinct types of pneumoconiosis are important, namely silicosis and asbestosis. Asbestosis is the exception to the general rule in that it is a silicate, a form of combined and not free silica, which does produce a characteristic fibrous reaction in the pulmonary tissue and which may produce disability and death. In animal experimentation, intraperitoneal injection of asbestos dust produces an inert reaction—that is, there is no cellular proliferation as is observed with the various forms of silica. Inhalation experiments produce a pulmonary fibrosis similar to that in human beings, with the curious anomaly that fibrosis did not result when the finer dusts were used. This has led Gardner to believe that the action of asbestos in the lungs is probably mechanical and due to the peculiar shape of the asbestos spicule and the constant movement of the lungs. Further support is given to this theory in that, unlike silica, asbestos will not produce its characteristic reaction in animals in other than the pulmonary tissue.

Asbestosis first came into prominence in this country about 1930, since when a number of industrial studies have been made. The symptoms are largely similar to those of silicosis but the pathology and the appearance on an x-ray film are entirely different. The x-ray shows a diffuse haziness or ground glass appearance, especially in the lower half of the lungs; nodulation is absent, and the factor of infection appears to be much less important than in silicosis, at least that is our experience in this country. The total number of workmen exposed to asbestos dust inhalation is very much smaller than for silica and strenuous efforts have been made by asbestos plants to control their dust hazard. Asbestos fabrication is a factory industry, largely textile in character, and the control of dust is less difficult than the control of silica dust in mines and foundries. Consequently, there has not been and probably never will be, the opportunities for the clinical study of asbestosis such as have been

made possible by the wide variety and extent of silica occupations.

A small number of deaths from asbestosis have been reported and not all of these have been followed by postmortem. Mostly other organic disease was also found or diagnosed, which tends to confuse the rôle of asbestos in these cases, but in some cases death undoubtedly resulted from uncomplicated asbestosis.

There has not been sufficient opportunity in field surveys of asbestos plants to acquire enough information to correlate the production of asbestosis with varying degrees or intensities of dust exposure nor have the conditions of dustiness, as evidenced by particle counts, run as high as in the more severe types of silica dust exposure. We have had under observation for ten years a small group of workmen with asbestosis. Some of these have shown a progression on their x-ray films. They are still working and in seeming good health. However, in the meantime the plant has been cleaned up and the dust controlled so we do not know what would have been their history had they continued to work under the former, presumably hazardous conditions.

Our original concept of silicosis was based on studies of industries in which there was generally a more or less severe exposure to dust containing a high percentage of free silica. As industrial investigations came to include a wider variety of industries, our concept broadened and underwent some modifications. The data gained in industrial surveys, when correlated with laboratory findings, cleared up a number of apparently conflicting and puzzling observations. Not only did we learn that the incidence and progress of silicosis in any location depended upon the amount of silica dust in the air and the length of exposure, but it was demonstrated that in many instances other substances were present in the dust with the silica and that these substances modified the action of silica. Furthermore, it was shown that the action of silica was not due to its physical properties but to its chemical properties. Also, where certain substances had been accused of causing a pneumoconiosis, the offending agent was in fact the silica which was also present. Metallic dust, for instance, which in the early writings had been considered as more dangerous than silica, was found to be relatively harmless. There came a better understanding of what caused the variations in the clinical appearance

and course of silicosis as observed in different locations and in different industries. Men engaged in iron ore mining and in quarrying and cutting granite are exposed to dust containing silica and other substances as well, which tend to retard the action of silica upon the lung tissue. The pathologic process is altered and the appearance on the roentgenogram is altered sufficiently for the experienced physician to distinguish one type of exposure from another. With the mixed dusts, the progress of silicosis is usually slower and when infection occurs, it tends to be more chronic but the amount of tuberculosis found among granite workers and iron ore miners is nevertheless inordinately high. Cases have been reported of workmen exposed to dust containing silica and caustic alkalis which produced a rapidly developing and fatal type of silicosis with early infection.

On the other hand, certain industries have been studied in which the silica hazard was found to be of a degree which would not produce disabling silicosis within the average working lifetime. After forty or more years of such exposure, many workmen would show typical nodulation on the roentgenogram, but their symptoms were few or absent and they were still working every day, many of them being well over sixty years old. All of this emphasizes how necessary it is to study the etiological factors in order to arrive at a correct solution of the silicosis hazard in a given location or in a particular industry. It also explains the apparently conflicting conclusions that are sometimes drawn from isolated cases of silicosis when the work conditions, that is, the nature and type of exposure, have not been or cannot be determined.

The pneumoconiosis of coal miners illustrates very well the modifying action of one dust upon another. Miners' asthma had for years been recognized by physicians in the anthracite industry as a definite clinical entity. It was difficult to believe, however, that coal, an organic substance, could produce a disabling pneumoconiosis. The Public Health Service made a thorough study of the anthracite industry in 1933 and the results of this confirmed what many observers had suspected, namely, that disabling miners' asthma was, in fact, a silicosis; a form of silicosis modified by the combined action of silica and anthracite dust, and to which the term anthraco-silicosis might justly be applied. The incidence and prog-

ress of disability was, as in other silica dust hazards, proportionate to the extent of dust exposure. The silica was accounted for by the fact that the veins of coal lie between rock formations which frequently have a fairly high silica content, and, also, that there was some silica in direct association with the coal itself. Consequently, the workers had some silica exposure. Anthracite mine dust varied in its silica content from about 11 per cent for miners working directly in coal to about 60 per cent for men working in rock, with various types of exposures falling between these two extremes. Pulmonary tuberculosis was associated with anthraco-silicosis to a very considerable extent.

Below the age of thirty-five, hard coal miners showed an incidence of pulmonary tuberculosis slightly less than that found among male workers in general. In the age group of thirty-five to forty-four, the tuberculosis incidence was twice as great, and from forty-five to fifty-four, five times and above fifty-five about ten times the rate for all adult male workers. Or, to express it in another way, clinical pulmonary tuberculosis was found in 15 per cent of those with early anthraco-silicosis and in 43 per cent of those in the more advanced stages. The x-ray appearances, while similar to the silicosis of hard rock miners, can usually be differentiated from the latter.

With respect to bituminous coal mining, the silica factor is apparently less in extent or lacking entirely. A number of studies have been made by the Public Health Service but have not yet been published. Death certificates of soft coal miners were analyzed for a five-year period and showed no appreciable difference, with respect to deaths from tuberculosis, between the coal miners and the farmers living in the same counties.

Inhalation experiments with bituminous and anthracite coal (1.76 per cent SiO_2) have produced a very slight reaction and anthracite dust proved inert on intraperitoneal injection. We may conclude that in the absence of silica, coal will not produce a specific fibrosis associated with disability.

The relationship between pneumonia and silicosis is not entirely clear. The data obtained from various studies and from animal experimentation are not always consistent. The high incidence of pneumonia in some industries with a silica hazard can not be disassociated from ex-

posure to extremes of heat or cold or both. Coal miners have a high incidence of pneumonia and it is a common cause of death among the older men with anthraco-silicosis. My own impression is that individuals with any considerable amount of silicosis have a more unfavorable prognosis in pneumonia than would otherwise be expected but this experience is not very recent. It remains to be seen whether silicotics respond to specific serum treatment or chemotherapy as well as do those who do not have dust fibrosed lungs.

Summary

There is still much to learn about the action on the lungs of many kinds of dust. The effects of pure silica (SiO_2) have been demonstrated under many conditions in this and other countries with a high unanimity of agreement among investigators. Where the silica damage to the lungs is extensive, the incidence of tubercle infection is high. Where the silica exposure has been extreme, a tuberculous infection is almost inevitable, but every physician who has had wide experience with these cases has seen exceptions to this rule.

Today in American industry, severe exposures are uncommon. They occur mostly as isolated instances as when a sandblaster has been working with faulty protection. Tuberculo-silicosis may run a very chronic course, but if the silica damage is extensive, the progress may be fairly rapid, but many exceptions will be found to the general rule.

We are acquiring a constantly broadened knowledge of the action of mixed dusts, that is, dusts containing other substances along with the silica, but the more intense the silica exposure, the more these cases run true to type. Naturally the clinical picture of silicosis is changing as industrial dust control becomes more and more perfected so that we may expect to see more and

more of the type or degree of silicosis which is accompanied by little disability. I am convinced, however, that where the reaction has proceeded to cause nodulation, even though moderate in extent, a definite, increased susceptibility to tuberculosis takes place.

Finally, we must consider the criteria upon which the diagnosis of silicosis can be based. Undoubtedly, the early manifestation of silica dust reaction is peribronchial thickening with an increase of the hilum shadows, as seen in a roentgenogram. The same may be seen in workmen exposed to dusts other than silica and in individuals who have never had any sort of dust exposure. Consequently, those of us who got together several years ago under the leadership of Dr. Pancoast, felt that for practical purposes, a diagnosis of silicosis was not justified unless the specific reaction of nodulation, as found in experimental animals as well as in human subjects, was present.

In addition to a characteristic film, there must be a history of exposure to silica dust adequate to produce disease. Where an industrial investigation is being made, and the working conditions previously determined, it is usually not difficult to separate the silicotics from the non-silicotics and usually the presence of infection can be recognized or ruled out, careful consideration being given to the physical signs and the symptoms as well as the x-ray film. The isolated case that may turn up in hospital or clinic service may present considerable difficulty. Such patients are apt to be suffering from a combination of illnesses. They usually cannot give a sufficiently informative work history and even with a characteristic film, it may be difficult to say that a patient has silicosis (or even more difficult, asbestosis) and to what extent his pulmonary condition may be responsible for his symptoms or his disability.

INFECTED DERMOID CYST OF THE THORAX SIMULATING CHRONIC EMPYEMA*

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AN INFECTED dermoid cyst of the thorax which simulates chronic empyema is interesting from two standpoints: first, because of the rarity of this manifestation of a dermoid cyst, and, second, because of the difficulty of diagnosis.

began in 1925 when he was four years old with an acute illness which was diagnosed pneumonia. After this postpneumonic empyema was thought to have developed on the right side and drainage of the right pleural cavity was instituted. Drainage gradually subsided and after a period of about two months the

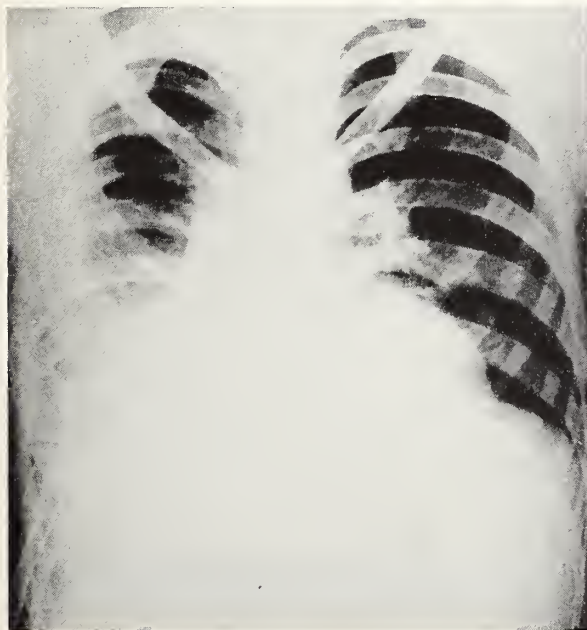


Fig. 1. The thorax prior to operation. The increased density in the lower lateral and posterior portions of the right side of the chest was interpreted as being due to markedly thickened pleura, probably associated with chronic empyema.



Fig. 2. Pedunculated growths removed at operation. The epithelial nature of the covering can be noted and a few fine hairs can be seen protruding from the tumors.

Dermoid cysts of the thorax arise practically without exception of the mediastinum, although they may arise within the lung. It is not rare for them to encroach on one or both pleural cavities but for a dermoid cyst to produce symptoms which seem to be in a pleural cavity without any obvious evidence of a mediastinal counterpart is rare. Harrington, in 1937, reported sixteen cases of mediastinal dermoid tumors from The Mayo Clinic. In none of these was the clinical course similar to that in the case which we are reporting.

The patient, a youth fifteen years of age, was first seen at The Mayo Clinic May 29, 1939. His trouble

wound was entirely healed and the patient seemingly was restored to normal health.

The patient was free of symptoms for nine years. Then after a period of anorexia, sweats, chills and fever, a diagnosis of chronic empyema of the right side was made elsewhere and right thoracotomy was performed for drainage. The patient's father said that at that time considerable yellow cheesy material drained from the wound. In the next five years four more operative procedures were performed to facilitate drainage.

General examination at the clinic revealed nothing abnormal other than the condition in the thorax and slight emaciation. Early clubbing of the nails was noted. There was a draining sinus on the right in the posterior lateral portion of the chest wall which contained a rubber tube. The patient was 64 inches (162.6 cm.) in height and weighed 95 pounds (43 kg.).

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The value for hemoglobin was 11.4 gm. per 100 c.c. of blood. Erythrocytes numbered 3,850,000 and leukocytes 12,000 per cubic millimeter of blood. A roentgenogram of the thorax revealed the drainage tube in place and thickened pleura on the right (Fig. 1).



Fig. 3. Squamous epithelium and the skin appendages, hair follicle and sebaceous glands, which are diagnostic of a dermoid, are well shown ($\times 50$).

A diagnosis of chronic empyema of the right lung was made and on May 30, 1939, surgical intervention was instituted. The sinus was explored with a probe and was found to extend outward and upward for approximately 18 cm. Accordingly, a portion of rib immediately over this sinus was removed and the cavity unroofed. A large quantity of purulent material mixed with a caseous looking substance was scooped out. A cavity which measured about 10 cm. in diameter was revealed. Several peculiar looking rounded tumors, covered with skin and hair, were firmly attached to the inner and lower portions of the cavity (Fig. 2). Communicating with the main cavity in the mid-portion was a small cavity which probably represented an empyema pocket associated with the dermoid cyst.

As much of the contents as possible were removed from the cavity but it was impossible to remove all of the wall of the cyst. Consequently, the lining was destroyed with phenol and then the part treated was well cleansed with alcohol. The communication be-

tween the cyst proper and the empyema pocket was enlarged in order to establish free drainage. The whole cavity was packed lightly with plain gauze. The pathologist reported the tissue removed to be a dermoid cyst lined by squamous epithelium with hair follicles and sweat glands and containing sebaceous material. A section from one of the pedunculated growths demonstrated clearly the fact that this intra-thoracic lesion contained all of the elements of the skin (Fig. 3).

The patient's postoperative course was uneventful. A transfusion of 500 c.c. of citrated blood was administered on the second postoperative day as a supportive measure. The drainage gradually subsided and the cavity slowly began to fill in with healthy granulation tissue. The patient was dismissed from the clinic July 5, 1939, and at that time the cavity had filled in partially with clean granulation tissue and there was no sign of any remaining portion of dermoid tissue.

Since dismissal reports have been received from the patient and his attending physician. Convalescence was satisfactory and the boy rapidly gained weight and strength and soon was able to engage in all the activities of his associates. The cavity continued to fill in and when the last report was received in February, 1940, there was only slight drainage.

The ultimate prognosis in this case must be guarded because it is possible that a remnant of the cyst wall has escaped destruction by the phenol. However, the chronically infected cyst which was gradually undermining the patient's health has been eliminated and the immediate prognosis at least should be favorable.

Although an infected tumor simulating chronic empyema is undoubtedly rare, the possibility of such a syndrome should be considered in cases of a persistent draining from the thorax. Not infrequently chronic empyema may be allowed to persist indefinitely because adequate drainage of the empyema cavity has not been effected. The exact nature of the lesion in this instance was determined only after adequate drainage had been established.

OBSERVATIONS ON THE OCCURRENCE AND PREVENTION OF SUDDEN DEATH

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THE frequency of unexpected sudden death calls attention to this condition as a problem to be studied from the aspects of occurrence, mechanism and prevention. It may occur in individuals apparently in good health or in patients whose conditions give no indication that such an outcome might occur. Since a structural defect is only exceptionally found to account for it, it has been logical to consider it as predominantly a cessation of cardiac function on a physiologic basis.

Under two known mechanisms, ventricular standstill and ventricular fibrillation, the heart may suddenly cease functioning. These may be transient but ventricular fibrillation is rarely so. Experimentally, Hering³ was unable to produce death by ventricular standstill. In patients with Stokes-Adams syndrome, the syncopal attacks are nearly always due to transient ventricular standstill, and it is probable that sudden death in these patients may be explained on that basis. This group accounts for a very small proportion of those dying suddenly.

Ventricular fibrillation, however, rarely reverts to an effective ventricular rhythm and it has therefore been considered by many to be the most likely cause of sudden death. Animal experiments and clinical observations in recent years have tended to verify this opinion and much has been done to explain the mechanism by which this accident occurs. Thus Hering³ claimed that ventricular fibrillation in animals was an irreversible process, with lethal outcome. It is well known that experimental ligation of a coronary artery will produce ventricular fibrillation. Furthermore, the occurrence of frequent ventricular premature contractions and ventricular tachycardia shortly before sudden death in coronary thrombosis suggests that the latter accident is due to ventricular fibrillation, especially since these irregularities have been described by Schwartz¹³ and his co-workers as prefibrillatory arrhythmias announcing the imminence of transient ventricular fibrillation in the cases they reported.

Of great importance have been the recent contributions which indicate that the intimate mechanism of sudden death is to be explained on the

basis of sympathetic nerve stimulation of a myocardium sensitized by some toxin or disease state. In view of the evidence that general sympathetic nerve stimulation acts through chemical mediation of an epinephrin-like substance produced at its site of action, it seems probable that the innervation of the myocardium acts likewise. This view is supported by a number of observations by various investigators. Thus, Rothberger and Winterberg¹² found that in dogs partially poisoned with barium chloride, sympathetic nerve stimulation or the use of epinephrin would produce ventricular fibrillation. Otto¹¹ showed that the ventricular fibrillation caused by coronary ligation in dogs was prevented by section of the sympathetic fibres. Hooker⁴ has reported experiments in dogs in which areas of fibrillating ventricular myocardium were cut away from the heart with a resulting cessation of the fibrillation, even a return to rhythmic contraction being recorded. While he did not attempt to draw the inference from these experiments, it seems likely that some substance was being elaborated by nerve action on the myocardium and resulted in ventricular fibrillation which stopped in a segment of the heart muscle when it was cut away from the whole. Whether this substance is identical to epinephrin or is an epinephrin-like substance (sympathomimetic amine) it is probable that it plays an important rôle in the production of ventricular fibrillation in human subjects.

This conception of the mechanism of ventricular fibrillation leads to the consideration that sudden death due to this cause might be preventable if it were possible to select those patients who after clinical study were considered liable to this condition and if some measure were available to counteract the action of epinephrin or reduce the irritability of the heart muscle. An attempt to throw some light on these two problems is made in the present study.

Concerning the first, a study was made of the records of all patients who, among the 22,490 admissions to Ancker Hospital during 1934-1935, died suddenly, unexpectedly and with no indicated or proved structural defect to account for

such outcome. (Autopsies were performed on 50 per cent of these patients). From this analysis certain facts emerged which indicate the type of patient in which this accident has a tendency to occur. These will be discussed.

Concerning the second, recognition was given the probable rôle of epinephrin or an epinephrin-like substance in the mechanism of ventricular fibrillation. Nathanson has shown that no satisfactory antagonist to epinephrin can be used clinically. However, it is possible to depress myocardial irritability, and in view of the effectiveness of quinidin in the treatment of auricular fibrillation, it has been used therapeutically and experimentally with apparent success in producing this effect in conditions of known myocardial irritability. It has been considered successful in preventing ventricular arrhythmias (Scott, Levine and Fulton).¹⁴ Cases have been reported (Dock,¹ Escamilla²) where quinidin seemed to prevent attacks of paroxysmal ventricular tachycardia. Levine⁶ and Jackson, Friedlander and Lawrence⁵ showed that quinidin inhibited experimental ventricular fibrillation in animals. Nathanson⁹ in experiments on human subjects, was able to inhibit by quinidin the onset of pre-fibrillatory rhythms which were produced by sympathomimetic amines. Morawitz and Hochrein⁸ used quinidin empirically with success in an attempt to prevent sudden death. These contributions indicate that quinidin modifies the action of the substance which presumably produces ventricular fibrillation, and provides a rational basis for the possibility of attempting to prevent such a development in individuals who may be considered liable to sudden death.

The present study is based on an analysis of the cases of sudden unexplained death in a large general hospital (Ancker Hospital, Saint Paul) over a three-year period, 1934-1935-1936, during the third year of which quinidin sulphate was administered to patients who seemed liable to sudden death as shown by the experience of the first two years. The series consists of fifty-one patients in whom death was unexpected at the time, sudden in its appearance, and unexplained on a basis of structural change. Omitted therefore were the sudden deaths due to rupture of the heart, ruptured aortic aneurysm, and other conditions where demonstrable cause for this type of death was present. Autopsy verification of the diagnosis was obtained in twenty-five of

TABLE I. UNEXPLAINED SUDDEN DEATHS—
ANCKER HOSPITAL

Diagnosis	1934	1935	1936
Coronary Sclerosis	8	3	0
Cor. Scler. + Hypertensive Heart Disease	3	6	3
Coronary Sclerosis + Aortic Stenosis	3	4	0
Coronary Thrombosis	5	4	1
Hypertensive Heart Disease	1	3	0
Aortic Stenosis	0	1	0
Syphilitic Aortitis	1	1	0
Miscellaneous Group	2	1	1
Total Admissions	11,036	11,454	10,753
Total Deaths	896	786	888
Sudden deaths	23	23	5
(Per Cent of Total)	(2.57%)	(2.93%)	(.56%)

the fifty-one cases. As shown in Table I, this material is derived from a total of 2,570 deaths occurring in a total of 33,243 admissions to Ancker Hospital, Saint Paul, during this period.

While the number of cases is not large, certain facts stand out in a study of the 1934 and 1935 sudden unexplained deaths (twenty-three such fatalities each year) which were helpful in indicating the patients most liable to such exitus.

Sex.—Divided according to sex, these cases show a great preponderance of males. In 1934, there were twenty males and three females, and in 1935, nineteen males and four females.

Age.—A marked tendency for these deaths to occur at advanced ages was demonstrated, 76.1 per cent occurring after the age of sixty, with the peak decade being that of the seventies.

Electrocardiography.—Electrocardiograms were recorded in twenty-one of the cases. All of these showed abnormal T waves and eight showed QRS abnormalities, notching, slurring and widening.

Congestive Failure.—As might be expected in a group of hospital patients congestive failure was not uncommon, although all cases in which this condition was the direct cause of death were eliminated. Twenty-nine were in congestive failure when sudden death occurred and seventeen patients were in a state of good compensation.

Arrhythmias.—Since it is known that arrhythmias, especially premature contractions, precede the onset of ventricular fibrillation, it is of interest to note that fourteen (30.4 per cent) of

the patients showed numerous ventricular premature contractions. Auricular fibrillation was present in seven (15.2 per cent) of the patients.

Diagnosis.—In all except two cases a definite diagnosis of heart disease was made (Table I). The exceptions might possibly have been included had autopsies been permitted. These were patients with involutional melancholia, aged fifty-seven, and convalescent hemiplegia, aged seventy-two. Degenerative heart disease is seen to be outstanding, coronary sclerosis alone or associated with hypertensive heart disease, coronary thrombosis, or aortic stenosis accounting for 78.3 per cent of the patients. This does not present the real incidence of coronary sclerosis since one patient in a miscellaneous group, an asthmatic, showed coronary disease at autopsy, and other deaths occurred at ages where such condition is common. Another observation of interest relates to the diagnosis of aortic stenosis. This was made in eight instances, in seven of which there was a complicating coronary sclerosis. All of the seven patients were between fifty-eight and eighty-eight years of age. Sudden death in uncomplicated hypertensive heart disease ranked relatively low in the group, only four cases being found. Syphilitic aortitis contributed two cases, and the miscellaneous group is composed of one case each of asthma, hemiplegia, and involutional melancholia.

In view of the foregoing experience of the years 1934 and 1935, with the coöperation of the various hospital services, it was decided to administer during 1936 quinidin sulphate three grains three times daily to all patients with degenerative heart disease, aortic stenosis or syphilitic aortitis upon admission to the hospital. The drug was given in addition to any other indicated therapy and stopped if not well tolerated.

The figures presented for this year show a marked decrease in sudden deaths although the general hospital mortality was higher than in the previous years. Only five deaths occurred, four in patients with coronary sclerosis complicated by hypertensive heart disease or coronary thrombosis with congestive heart failure, and one in a patient with advanced pulmonary tuberculosis on whom an autopsy was refused but no recognized cardiovascular disease had been found. Of the four cases with degenerative heart disease quinidin had not been given in three. A

brief review of these five histories is presented as follows:

Case 1.—A woman, aged sixty-five, was admitted with severe dyspnea, substernal pain, auricular fibrillation and shock. Onset had been sudden and diagnosis on a previous admission was hypertensive heart disease, electrocardiogram showing left axis deviation and inverted T waves in lead I. Admission diagnosis was coronary thrombosis. The patient died suddenly twelve hours after admission. Quinidin was not administered.

Case 2.—A man, aged seventy-two, was admitted complaining only of pain in the left foot. The diagnosis of coronary sclerosis and diabetes complicated by gangrene of the left foot was made. The electrocardiogram showed auricular fibrillation, QRS notching and T wave inversion. Compensation was good. The patient died suddenly in bed. Quinidin was not administered.

Case 3.—A woman, aged seventy-two, was admitted with edema, dyspnea, cyanosis and auricular fibrillation. A diagnosis of congestive heart failure on basis of hypertensive heart disease and coronary sclerosis was made. Quinidin was administered. Clinical course was not favorable, but the sudden termination was unexpected. Diagnosis was verified by autopsy.

Case 4.—A woman, aged forty-five, complained of nocturnal dyspnea and precordial pain on exertion. Clinical diagnosis was hypertensive heart disease with auricular fibrillation. No congestive heart failure was present. The electro-cardiogram showed QRS and T wave abnormalities. Quinidin was not administered. The autopsy showed cardiac hypertrophy, coronary sclerosis, myocardial fibrosis and cerebral malacia.

Case 5.—Male, aged fifty-four, was a patient on the tuberculosis pavilion with no significant complaints and heart disease was not suspected. Clinical diagnosis of advanced pulmonary tuberculosis was made. Autopsy was not performed.

From these results it is obvious that the desired administration of quinidin to all patients for whom it was intended was not entirely accomplished. While the total number of omissions was not determined there is reason to believe that it was small. It is of particular interest therefore to note that only one of the patients who died suddenly in 1936 had received the drug, and the question may be properly raised as to whether or not the rather advanced state of congestive heart failure here should not have contraindicated its use.

Discussion

Inasmuch as it is impossible to state what percentage of patients suffering from heart disease died directly from this cause it is therefore im-

possible to determine what proportion of these die suddenly. However, some idea of the importance of the subject can be obtained from the studies of Nathanson¹⁰ who found that 60 per cent of 113 patients dying of occlusive coronary disease died suddenly. These figures are high because they include deaths outside of the hospital, much more often sudden than in the hospitalized group in this class of patients. Nevertheless they emphasize the problem as more important than its casual consideration would suggest.

While it appears that the majority of the sudden deaths in the years surveyed were not associated with congestive heart failure, these figures may be misleading. The state of compensation described was that present at the time of death, while many of the compensated patients had been decompensated on admission to the hospital. The present study at least suggests that sudden death occurs more often in those without congestive failure.

The general hesitancy in the use of quinidin in congestive heart failure merits consideration as to whether its use was justified in such patients included in this study. Unless Case 3 could possibly be considered as a quinidin death, no patient who had received the drug in 1936 died suddenly or developed the arterial emboli so feared by some investigators.

The desirability of the use of quinidin in an attempt to prevent sudden death is open to discussion. Considerable difference of opinion exists as to the justification for the use of a drug continuously over a patient's lifetime when a certain clinical picture presents itself. Much can be said on both sides. As far as risk is concerned in the continued prophylactic use of quinidin no known well controlled studies point to danger, and the present study would not indicate such to exist. The psychologic effect on the patient of the use of a drug designed to prevent sudden death would be most unfortunate if the purpose were made known, although the matter of pro-

longed administration should not be a serious objection. On the other hand this study would suggest that such a prolonged regime of quinidin administration may in many instances extend a comfortable and useful existence for many patients with heart disease. Further studies should be made of this subject before any crystallization of opinion can take place.

Conclusions

Results obtained by the use of quinidine sulphate in the present study furnish clinical support to the belief that ventricular fibrillation is the usual cause of sudden death.

Observations are made which support the suggestion that quinidine sulphate may be effectively used in preventing sudden death in patients liable to it.

This study indicates that the patients in whom sudden death is most apt to occur are of advanced age, suffering from degenerative or syphilitic heart disease, showing abnormality of the electrocardiogram and frequently manifesting arrhythmias.

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WHAT'S WRONG WITH THE PATIENT WHO IS ALWAYS TIRED?*

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EVERY week I see a number of patients whose main complaint is that they are tired and exhausted. They have no "pep," and the least exertion makes them feel worn out. Many complain that they cannot do their work properly and they can't get much fun out of life. The stenographer or clerk can't go out with her beau in the evening and the wife can't go anywhere with her husband and enjoy it. The school teacher can barely get by until Friday, and with her it is always a race between a nervous breakdown and the end of school in December and May. We physicians are all seeing these persons, and we all wish often that we knew what is wrong with them.

From the letters from prominent physicians which many of these patients bring with them, I gather that the medical profession today is inclined to look on these complaints as due to some localized disease or focus of infection somewhere in the body. As a result the patients are put through one expensive and exhaustive laboratory and roentgenologic examination after another. All possible foci of infection are removed or treated, and occasionally in desperation a surgeon will explore the abdomen and remove the appendix.

When nothing is found, the patient moves on, and the next clinician promptly puts the patient through another complete examination. He and the patient both hope that some local disease will be found which was missed before. Unfortunately the pressure on the physician to find some local cause is so great that he is likely to grasp at whatever diagnostic straw is offered and to make all he can of one basal metabolic rate of —15, one blood pressure reading of 105 mm., one blood sugar determination of 85 mg. or a little spasticity of the colon.

All this does not mean that when a patient who has been strong and well begins to feel tired out a careful examination should not be made. It most certainly should be, and this is particularly true when the failure in strength and energy and the loss of a sense of well-being come to a man

or woman past middle age who has previously enjoyed good health. In such cases it usually means the coming of some serious disease, and the physician must hunt through the body for carcinoma or for signs of pernicious anemia, hypothyroidism, hypertension, diabetes, or a failing heart or kidney.

If the fatigue and loss of "pep" and interest in life come suddenly in a person past middle age, the cause is almost certainly a small stroke. Curiously, physicians rarely think of this possibility when the thrombosis does not happen to involve the centers for speech or for arm or leg. Commonly the episode is thought to be due to an "acute indigestion" because it is so often associated with dizziness and a storm running down the vagus nerves to produce vomiting and abdominal discomfort. Sometimes careful history taking will show that there were several of these small episodes. Often they come in the morning when the patient wakes. Especially after several of them there is likely to be some loss of memory, a loss of interest and zest in life, and perhaps an inability to work. Unfortunately, this sudden and marked change in the temperament of the patient is seldom mentioned when the victim and his family are in the physician's office. The story must be dug out. It is important that the physician recognize the true nature of these little upsets because then he will know that it is useless to try to help the patient or to cheer him up. His brain is injured and he cannot be helped.

In younger patients the physician will, of course, check the lungs carefully. Occasionally the main symptom of chronic appendicitis in a previously healthy college student will be a mental slowing up and a feeling of toxicity and loss of "pep." If the physician can then dig out a story of one or more attacks of cramping abdominal pain, appendectomy is indicated. Occasionally a tired youngster will be found to have hypertension or hyperthyroidism. Young women are often worn down by the recurrence of episodes of painful menstruation. They do not recover completely from one spell before they are into another. Other young women are anemic from repeated flooding. The blood must always

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be examined carefully to rule out a beginning leukemia. Especially if a little fever is noted on some days it will be wise to see if the patient's serum agglutinates *Brucella abortus* in high dilutions.

Often the story will be that the fatigue state followed an influenza, and then in rare cases the physician may think of the possibility that there was a mild encephalitis. More commonly, after a respiratory infection, there will be a mild generalized arthritis or fibrositis; the patient will ache all over, and with this there will be a feeling of fatigue and toxicity. Occasionally the story will be that the patient thought he was poisoned by tainted food, and after the diarrhea stopped he was left with an irritable, gassy bowel and a tendency to diarrhea. In these cases one will suspect that a small intestinal enteritis has not entirely cleared up.

In most cases in which the patient is young or middle-aged, none of these things are found, and then the question arises: Did the patient overwork badly or did he have enough strain, unhappiness, sorrow or insomnia to break down the nervous system of a normal person? One sees this type of breakdown often in the case of a woman who has had several children in rapid succession. Perhaps she has been without a maid, and perhaps a mother-in-law in the home has been adding to her strain. Perhaps she had an operation, an auto accident, a difficult labor, or a bad attack of influenza, and then tried to go back to work too soon. Or the patient may be a shop girl whose hours are too long, or she is a factory girl whose work is too heavy, or the victim may be a hard-driving business man or a too busy physician who has never had a vacation. In all these cases, instead of repeating the examinations indefinitely, it seems to me more logical to make the patient take a rest and then see if there are any symptoms left.

In another large group of cases one will find that the patient was frail and asthenic to begin with, and then had heavier burdens put on him or her than could be borne. In such cases it will be obvious why the patient got into trouble.

Finally, there is a large group of tired patients who, so far as one can find, have not been under any unusual strain. They seem to break down only because the tendency was lying latent in the nervous system, inherited from some ancestor. Often bad psychic habits bring on the crash.

Thus, I remember once asking a fine looking young woman with a lovely home and a nice husband why she was on the edge of a nervous breakdown. I wondered what was wearing her out. Her answer was, "I wear myself out." As I came to know her I found how true this was. She was the type of psychopathic person who can't make a decision even on minor matters, or if at last she makes one she can't stick to it. Her sister was insane, and her tendency to indecision was apparently her share of the family curse.

As I said, many of the persons in this group wear themselves out by using their brains unwisely, uneconomically, and to no useful purpose. In one hour of frantic worrying, or in one riot of emotion over some little happening, or in one "post mortem" over some unpleasant experience or ancient family row, a woman will use up more energy than a calm sensible person uses in a day. Some of these persons are so psychopathic, touchy, shy, diffident, or irritable that all the problems of working and living and adjusting to contact with their fellows are difficult and wearying. Others, and particularly women about the age of forty, are perfectionists: They want everything just so, and they wear themselves out trying to reform husband and to make the home spotlessly clean.

But every so often the physician will find a tired and depressed patient who apparently hasn't many bad mental habits, who hasn't had obvious strain, and who has had no grief or cause for worry. What then? Then if the physician will only take the trouble to get a good history, often from a relative, he is likely to find that one or more of the patient's close relations have suffered with melancholia or depressions of some kind. In many such cases there can be no question that the patient's real difficulty is a mild depression. It represents what he or she got out of the family grab-bag of inheritance. One can be even surer of this when one can get the patient to tell how between periods of depression he or she has been too energetic and talkative and ambitious. Such persons have a cyclic temperament with their ups too high and their downs too low. Fortunately, in most of these cases the defect that sent a mother or an aunt to the insane asylum was diluted by good genes from the other side of the family, and hence such depressions are compatible with the maintenance of a useful life.

It always saddens me to see these persons who have so definitely a psychiatric problem being put through all sorts of medical overhauls and being treated strenuously for amebiasis, low blood pressure, low blood sugar, or low blood calcium, or perhaps being operated on in the hope that some causative lesion will be found in the abdomen. It is unfortunate that we physicians at college had practically no training in psychiatry, and hence we are so unprepared to recognize the insanity of those many persons who remain quiet and well behaved. Worse yet, when consulted by these patients, clinicians will often ignore or ridicule the diagnosis of insanity after it has been made for them. I have seen them keep ignoring it until the patient finally gave up and took refuge in a sanatorium for "mental cases."

The point I would like to emphasize is that when a patient is depressed and apparently exhausted without obvious cause, when two or three overhauls have failed to reveal any organic disease, and when one or more near-relatives have suffered with melancholia, the physician should begin to suspect that the trouble is a mild depression.

Summary

Many patients complain primarily of fatigue and easy tiring. They get put through one thor-

ough examination after another with the hope that some local disease or focus of infection will be found. Usually this isn't found. Naturally one careful examination should be made, especially when ill health comes after middle age to a person who has been previously well. Then one may find serious disease such as cancer, anemia, hypertension, diabetes, hypothyroidism, or a failing heart. If in older persons depression, fatigue, loss of interests, change in personality, and an inability to work come suddenly, the cause is probably a slight stroke. In the case of college students, ill health with indigestion and feelings of fatigue may be due to subacute appendicitis.

In many cases nothing is found on thorough examination. Then the physician must be careful not to grasp at diagnostic straws. Then he must see if the patient has had enough strain, unhappiness, sorrow or insomnia to account for the situation. In many cases, with or without strain, a person with a psychopathic inheritance breaks down. In some cases the patient's fatigue and nervousness represent an equivalent of melancholia in a near relative. It is most unfortunate that mild melancholia is today rarely recognized by clinicians. The average physician today has little ability to recognize the patient with borderline insanity.

POLYNEURITIS WITH FACIAL DIPLEGIA (NEURONITIS) FOLLOWING SERUM SICKNESS IN AN ADULT

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DESCRPTIONS of the syndrome of polyneuritis with facial diplegia have appeared in medical literature under a variety of names. Different authors have referred to the disease as acute febrile polyneuritis, curable polyradiculoneuritis with albumino-cytologic dissociation, radiculoneuritis, meningoradiculoneuritis, myelodradiculitis, et cetera. Probably the first description of the disease in English was given in 1898 by Mills² who called it "neuronitis." Since then various authors have used this term but among neurologists controversy exists as to the proper name for the syndrome. We prefer the clinical designation of polyneuritis with facial diplegia for the reason that the pathological changes in

the central nervous system are variable, and any nosological designation embodying a description of these changes would not be sufficiently broad to include all cases.

In spite of the confusion in the literature over what this condition should be called, the clinical picture is a fairly constant one. The disease in the majority of cases is preceded by a mild transitory infection which may represent the stage of invasion of the causative agent. There then is a latent period of from one to fourteen days, followed by the appearance of signs of polyneuritis predominantly of the motor type. Some cases show mild sensory changes in the early stages, some have fibrillary twitchings, and in some there

is impairment of vesical or rectal function or both. The weakness and parasthesias usually begin in the lower extremities, involving the muscles of the trunk and upper extremities to a lesser degree in from one to four days. In about one-third of the cases facial paralysis of the nuclear type is present¹ and we have seen choked discs in a few cases.

The most constant feature of polyneuritis with facial diplegia is the albumino-cytologic dissociation in the cerebrospinal fluid. Although we have seen cases in which there were as many as 30 lymphocytes per cubic mm. of cerebrospinal fluid, the cell count in the great majority of cases is within normal limits. There *always* is an increase in the amount of spinal fluid protein. This increase might be slight, ranging around 50 mg. per 100 c.c., or it may be enormous reaching 1200-1500 mg. per 100 c.c. Without this albumino-cytologic dissociation one is not justified in making a diagnosis of polyneuritis with facial diplegia or of neuronitis.

The course of the disease is usually benign and recovery occurs in from six months to two years. Death may occur from respiratory paralysis, intervening sepsis, or general debilitation. In a series of thirty-five cases, Gilpin et al¹ encountered a mortality of 14 per cent. This is somewhat higher than our experience.

The number of pathological studies has been quite limited but Gilpin et al¹ found the pathological changes to be limited to the peripheral nerves and the dorsal root ganglia. The anterior horn cells as well as the rest of the spinal cord is not involved in the process which consists mainly of a patchy degeneration of the myelin with fragmentation of the axis cylinders of the peripheral nerves, without any evidence of inflammation.

The case we are reporting is unusual because the onset was not preceded by the usual type of infection, and the course of the entire illness was only a few weeks.

S. K., an unmarried male, thirty-two years of age, was a grocery clerk. His family history was irrelevant. He had acute rheumatic fever in 1913, a tonsillectomy in 1917, and influenza in 1919. No history of allergy in either the patient or his family could be elicited. Mr. K. was well until June 17, 1939, when at about 3 P. M. he stepped on a nail and sustained a puncture wound of the sole of the right foot. He applied tincture of iodine to the wound and continued to work. A few hours later, he began to have pain in the foot. Several hours later, one of us (M. W.) was consulted and

magnesium sulphate foot baths were prescribed. About thirty-six hours following injury, the patient received 1,500 units of tetanus antitoxin subcutaneously into the left upper arm. The foot improved and the patient returned to work on June 20th. He felt well the next day, June 21, but noticed a few hives over both upper extremities. That evening he had a chill and the next morning complained of aching in all his joints and he felt feverish. He went to work but about 4 P. M. had to stop because of general malaise. The temperature rose to 103 degrees. On June 23 the hives became more generalized and he stayed in bed. Two days later, June 25, he had diarrhea with vomiting, and temperature of 102.6. He remained in bed for four days and gradually improved. On June 29, his feet became numb and the next day both hands were numb but there was no muscular weakness. The numbness ascended to the wrists and knees and on July 1, fifteen days following injury, patient complained of backache. On the morning of July 4, he awoke with pain in back of neck, jaw and face. That afternoon he developed a paralysis of the left side of his face, and was admitted to Bethesda Hospital in Saint Paul.

Upon admission Mr. K. had a left facial paralysis of the peripheral type. The cranial nerves were otherwise normal. There was weakness of both grips and the supinator reflexes were absent. The muscles of the lower extremities showed a flaccid weakness of all groups. Deep reflexes were absent but no pathological reflexes were elicited. Touch, pain, passive motion and vibration sense were diminished in the hands and feet. The laboratory findings were as follows: Hemoglobin 78 per cent, red blood cells 4,070,000, white blood cells 8,400. Differential count normal. Urine normal. C.S.F. was under normal pressure, contained 155 mg. protein per 100 c.c., 7 lymphocytes per cubic mg. The Wassermann reaction was negative and the colloidal gold curve was flat. Temperature remained normal throughout patient's stay in the hospital.

During the first four days in the hospital Mr. K. became worse. The right side of his face became paralyzed and he had a complete facial diplegia. The right triceps jerk disappeared and the muscles around the shoulder girdles became weak. Pilocarpine sweats, potassium iodid by mouth, and daily subcutaneous injections of thiamin chloride were prescribed and in about three weeks definite improvement could be noticed. Sensation and muscle strength improved, the deep reflexes returned to normal and on August 9, 1939, the patient was released from the hospital with only a slight weakness of the left side of the face. On August 30, the examination was negative except for a slight weakness of the left side of the face and Mr. K. was permitted to return to full time work.

Comment

While the association between the serum sickness and the polyneuritis may be wholly fortuitous, it is not unreasonable to suppose that the serum sickness was the precipitating factor in

the disease. The possible rôle played by allergy in this condition has never been determined, but there are those who think that many of the more obscure types of involvement of nervous parenchyme are allergic in nature. In our case we were dealing with a perfectly healthy, robust, young adult male. He had not had a recent infection of any kind. Directly upon the subsidence of an attack of serum sickness which followed the prophylactic administration of tetanus antitoxin, he developed the early symptoms and, subsequently, all of the typical symptoms of polyneuritis with facial diplegia. The only way in which the course of the disease differed from the classical picture was that it was very much shorter.

This patient was injured during the course of his employment and the question of compensation was raised. Because of the close temporal relationship between the serum sickness and the involvement of the nervous system, and because of the absence of any other demonstrable etiological factor in the disease, compensation was

granted. One of our main purposes in reporting this case is to stimulate others to report cases of a similar nature should they occur.

Summary

1. Polyneuritis with facial diplegia (neuroitis) is a well established clinical entity, the etiology of which is obscure.

2. In the majority of cases the symptoms are preceded by a mild transitory infection.

3. A case is presented in which the symptoms appeared following an attack of serum sickness due to the prophylactic administration of tetanus antitoxin.

4. The patient was injured during the course of his employment and was granted workmen's compensation.

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PRIMARY ADENOCARCINOMA OF THE APPENDIX AND CARCINOID TUMORS

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R. S., aged sixty-four, was seen July 18, 1938, complaining of a sore spot on the right side of the abdomen just above the iliac crest. He had had pain of moderate severity for the preceding three days without nausea. For the last two days he had had no appetite. The pain in the abdomen was increased on deep breathing and coughing.

On May 15, 1937, I had seen him in the office when he consulted me concerning a pain in the right abdomen of two week's duration. At one time the pain was completely relieved after a laxative. On examination at this time there was no tenderness at all over the appendix area, but there was a tenderness above the right iliac crest. White blood cells were 11,000. Three days later the pain was gone and on examination there was no tenderness. I did not see the patient again for fourteen months. There had been no weight loss. No definite diagnosis was made at this time.

On July 18, 1938, his temperature was 99°; urine, normal; heart, normal. There was slight tenderness over McBurney's point and marked tenderness above the crest of the right ilium. White blood cells were 14,250.

A diagnosis of an acute retrocecal appendicitis was made.

On July 19, 1938, under special anesthesia, a right rectus incision was made. As soon as the abdomen was

opened free thin pus was found. The appendix was retrocecal. The head of the cecum and all of the intestines showed a general peritonitis. The appendix was removed in two pieces. The appendix lay wide open in its mid-portion and at this point the tissue of the appendix had a peculiar tumor-like appearance (Fig. 1). The appendix was gangrenous at its distal portion. The abdomen was drained.

Pathologic report: appendix was 10 cm. long; pus exudate in proximal portion. Near the mid-portion was a gelatinous tumor mass. Section showed a suppurative appendix and also an infiltrating epithelial tumor, portions of which had undergone gelatinous change with some differentiation into glandular elements (Fig. 2).

Diagnosis: 1. Adenocarcinoma with gelatinous degeneration. 2. Perforation with suppurative peritonitis.

Suction decompression was necessary, postoperatively. Convalescence was then normal and the patient was quite well.

On April 3, 1939, he complained of general pain in the abdomen after eating a heavy meal. He felt bloated but obtained relief after a satisfactory stool. A hard nodule was found at the upper end of the incision.

By May 8, 1939, he had lost some weight. The nodule in the fascia of the incision was larger and more tender. It was recognized as a possible metastasis and he was advised to have it removed.

At the time of operation the malignancy was recog-

nized while the appendix was *in situ* and the utmost care was used to prevent implantation. No forceps were used to clamp the appendix. But our exhibition consists of a ruptured appendix, a rupture due to a neoplasm. As the abdomen contained considerable free pus the possibilities of carcinoma cells being widespread had to be considered.

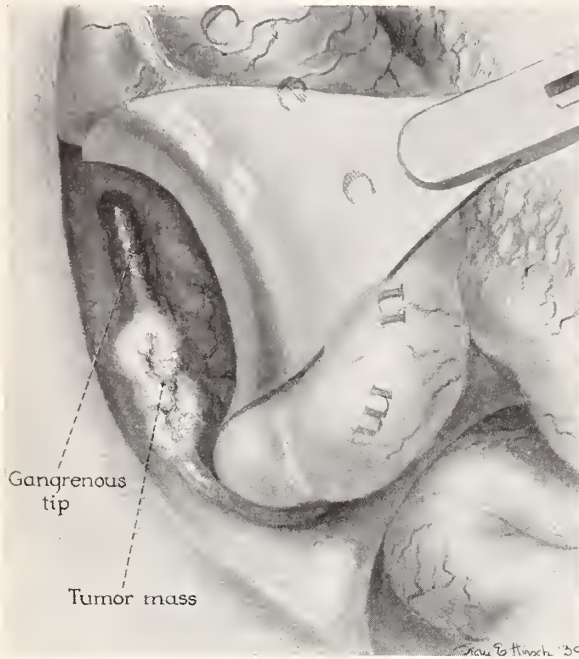


Fig. 1. Drawing showing appearance of appendix at operation.

On June 1, 1939, this nodule, which measured 3.5 cm. in diameter, was excised under local anesthesia. The nodule was not infiltrating and could be lifted while it was being removed from the rectus muscle. On gross section it appeared malignant and on microscopic section proved it to be a gelatinous adenocarcinoma.

Following this ascites required the tapping of three to four litres of a straw-colored fluid every ten to twenty days. The fluid became eventually definitely bloody. There was a steady loss of weight and constant pain throughout the abdomen. No masses could be felt after the fluid was removed, but another nodule formed in the incision.

Discussion

The pre-operative diagnosis in this case of carcinoma of the appendix was acute retrocecal appendicitis. All references in the literature stress the point that there has been no pre-operative diagnosis made of carcinoma of the appendix.³

In our case the carcinomatous involvement had caused a perforation and thereby an acute peritonitis. The malignancy was recognized before the appendix was removed from the abdomen. All of the small intestine and the cecum had a surface injection like that of an acute peritonitis. As the cecum was retracted medianwards the

appendix became visible with its proximal third injected, its middle third nodular and neoplastic and the terminal portion discolored and gangrenous.

Wagh and Findley¹¹ report a case of mucocele of the appendix which had degenerated into a carcinoma and then ruptured with a consequent generalized metastatic process of the whole pelvis. Our case is a parallel to this as here a carcinoma had been growing for some time until it ruptured through the malignant area without producing the classical picture of a ruptured appendix.

In the classification of the neoplastic processes occurring in the appendix the following four forms are to be recognized:

1. Appendicitis fibroplastica, the huge thick walled appendix.
2. Mucocele of the appendix, the occasional result of lumen obliteration, and rarely degenerating into malignancy.
3. Carcinoid tumor of the appendix, called by Aschoff¹⁰ "mucous membrane naevus," rarely showing metastases.
4. Gelatinous adenocarcinoma primary of the appendix; rapidly metastasizing.

The adenocarcinoma is of the gelatinous type and is the most common form found in all malignancies of the colon. The structure shows a scarcity of cells but an abundance of a gelatinous mucus.

It would be interesting to know just what pathologic picture was present fourteen months previous when the patient complained of indefinite pain in this area. At that time his symptoms disappeared upon correcting his constipation. Is it probable that he also had a mucocele following a lumen obliteration which degenerated into a malignancy? We can not prove or disprove this, but on careful examination of the removed specimen there were only solid tumor masses having a glassy appearance (the gelatinous structure).

It is probable that neither a mucocele nor a primary carcinoma nodule causes any pronounced symptoms and consequently no medical advice is sought. A rupture immediately precipitates an acute abdomen. In the carcinoid tumors⁸ the symptoms are those of an interstitial appendicitis of the chronic type.

The first authentic case of primary carcinoma

of the appendix is reported by A. Beger¹ in 1882. In a splendid article he recites the details of his case.

In a forty-seven-year-old man a "boil" appeared on the skin surface in the right inguinal region. This was opened and drained of an odor-

and speaks of it as resembling an amputation neuroma of peripheral nerves. In these cases Hasegawa could demonstrate in serial sections that the argentaffin cells separate themselves from the columnar cells of the Lieberkühn crypts and sink into the deeper parts where they are con-

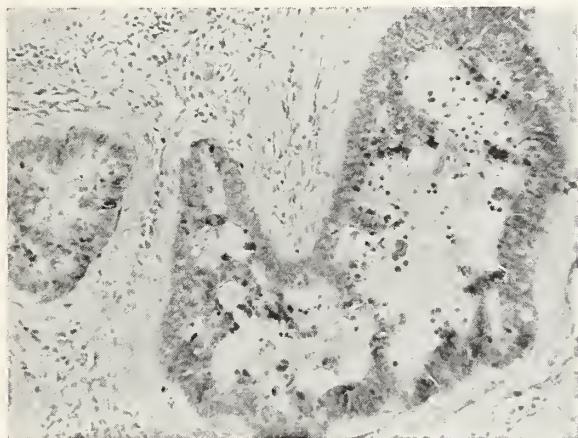


Fig. 2. Microscopic appearance of the gelatinous adenocarcinoma of the appendix.

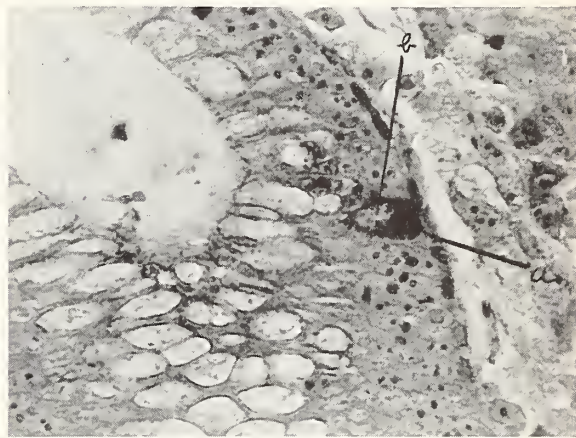


Fig. 3. Base of a Lieberkuhn crypt. (a) Argentaffin cell. (b) Its nucleus.

less pus with no gas or fecal material. Three and one-half years later the patient was operated upon under chloroform anesthesia with salicylic spray used for asepsis. This proved to be a carcinoma of the tip of the appendix, which had grown into the abdominal wall and had burrowed through the fascia and appeared as a raised "boil" on the skin surface. As the drained "boil" had not healed, a biopsy was made and a diagnosis was made of adeno-carcinoma of the bowel and correctly estimated as that of the appendix. This then is the only case on record where carcinoma of the appendix has been diagnosed before operation.

Hasegawa² states that the process of growth of the carcinoid is very slow and thinks most likely in the great majority of cases these tumors begin developing in early youth.

In an elaborate article Hasegawa establishes the relation of the carcinoid tumor to the argentaffin cells of the Lieberkühn crypts, and also demonstrates the metastatic possibility of the carcinoid tumor. He found that in the inflammatory process of the appendix, whether mild or acute, in which obliteration of the lumen takes place there is a process going on of amputation of the sympathetic nerve so that a neuroma of the sympathetic nerve develops,

stantly found surrounding the sympathetic "amputation" neuroma. Scattered throughout these neuromata were found cells resembling ganglion cells but in them could be demonstrated the argentaffin granules.

So silver salts are taken up by the granules of: (1) the few scattered argentaffin cells found normally in between the goblet cells of Lieberkühn crypts; (2) the cells of the carcinoid tumor; and (3) the ganglion-like cells of the amputation neuroma.

Hasegawa developed the following staining technic: Small pieces of tissue of an appendix or of a carcinoid tumor are fixed in formalin, then thoroughly washed in running water. Now the tissue is placed in a 2 per cent solution of silver nitrate and incubated for twenty-four hours at 98.6. After a short period of washing in distilled water it is again placed in an incubator for twenty-four hours immersed in the following ammonium hydrate silver nitrate solution: To 10 c.c. of a 2 per cent solution of silver nitrate are added seven drops of a 10 per cent solution of either sodium or potassium hydrate and the resulting precipitate is dissolved by using dropwise, liquor ammonia. After a running water treatment the tissue is dehydrated, embedded in paraffin, sectioned thin (5 micron)

and mounted. It is to be noted that the outside sections are very black. Then follow the sections of proper impregnation and deeper insufficient silver will be found.

Argentaffin cells⁴ are common in the crypts of Lieberkühn of the duodenum and appendix, infrequent in the jejunum, ileum and colon, and occasionally may be found in the stomach. Rarely are they found among the cells of the villi.

The argentaffin cell adheres closely to the basement membrane, is bottle shaped with the narrow part of the cell to the lumen. These cells may pass down through the limiting membrane of the lamin propria into the connective tissue. They are found singly or in groups and here they may become intimately connected with the nerves of the plexus of Meisner or form the carcinoid tumor.

There is no other special cell in the Lieberkühn crypt called the Paneth cell which is found only at the bottom of the crypt and only in the duodenum, jejunum and ileum. The Paneth cells have spherical nuclei and the cytoplasm at the lumen end has scattered large round secretory granules.

The argentaffin cells also have spherical nuclei, but have a fine compact mass of granules in the cytoplasm at the base. The granules of the Paneth cells respond to the chromaffin stains while the granules of the argentaffin cells respond to the silver stain.

The argentaffin cells make their first appearance in the fourth month of fetal life while the Paneth cells appear in the seventh month. The function of the granules of the argentaffin and the Paneth cells are not definitely known. Some histologists claim the Paneth cells are young goblet cells but if that were so we should also have the Paneth cell in the Lieberkühn crypts of the colon where they are definitely absent.

The interesting physiology of the intestinal glands and villi is that, besides producing digestive juices, there is a massive shedding of epithelium going on all the time. This requires a constant replacement, and the new cells develop in the bottom of the Lieberkühn crypts. So that the feces of a starving patient consist of the intestinal juices, mucus, bile and the desquamated epithelium.

Hasegawa quotes Masson who made this interesting observation: "Characteristically there are two types of cells in the carcinoid tumor,

one having vacuoles containing lipoids resembling the adrenal cortex and the other type having chromaffin granules resembling the cells of the adrenal medulla. With these characteristic likenesses in mind Masson named the growth "endocrine tumors of the appendix."⁴

Huebschman is quoted by Hasegawa in the declaration that the origin of the carcinoid cell is either from the Paneth cell or the argentaffin cell of Schmidt-Ciaccio.

Krompecher, who also is frequently quoted by Hasegawa, draws comparisons between the basal cell of the skin and the occasional cell found among the columnar epithelial cells of the intestinal or Lieberkühn glands as being also basal cells. He calls the tumors forming from these cells "Basaliom."

Scott⁶ records the age range from five to eighty-one years.

Vance⁹ reports that carcinoid has been reported in the literature as becoming malignant nine times.

The incidence of primary carcinoma in all appendices examined is 0.35 per cent, as reported by Selinger.⁷

The incidence of primary malignant tumors of the appendix varies in different large clinics. In large clinics about 1 per cent of carcinomata of the bowel occur in the appendix. Of all primary malignancies of the appendix, 10 per cent are carcinoma and 90 per cent are carcinoid.

In 1936, Rosenblatt and Robertson⁵ reported on 360 cases of primary carcinoma of the appendix. Rosenblatt, et al, report 0.2 to 0.5 per cent of all surgical appendices, as carcinomatous, while less than 0.5 per cent of all intestinal carcinomata are found primary in the appendix.

At St. Joseph's hospital, Saint Paul, from January 1, 1933, to September 1, 1939, the total number of appendices removed and studied were 3,692. Of this total number, our case is the only primary adenoma carcinoma of the appendix (0.027 per cent of all appendices studied). During this period there were eight cases of carcinoids reported or 0.216 per cent of all appendices studied.

Conclusions

1. Primary adenocarcinoma of the appendix is comparatively rare.
2. It is futile to attempt to make a preoperative diagnosis.

CASE REPORTS

3. If a rupture of the appendix occurs, metastases will be present within a year.

4. The similarity and difference between the adenocarcinoma and the carcinoid tumor is emphasized.

5. Other names for carcinoid tumors are: (a) mucous membrane nevus; (b) endocrine tumor of the appendix; (c) basaliom.

6. A case of primary adenocarcinoma is reported.

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CASE REPORTS

THE TREATMENT OF MYASTHENIA GRAVIS WITH ORAL PROSTIGMINE* Report of a Case in a Patient with Congenital Hemolytic Jaundice

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THE earliest description of myasthenia gravis was presented by Dr. Willis in 1685.²⁶ He said of "The Palsy" that "... motion fails wholly in part or member, but is performed weakly. . . . There is a scarcity of spirits so that on first arising in the morning they move their arms this way and that . . . but by noon, the store of spirits being spent, they are scarcely able to move." He describes a case in which the tongue was involved so that after talking for a time, the patient became mute for an hour or two. More accurate and precise descriptions of this condition were presented by several German investigators in the latter part of the 19th century, and by Wilks in England in 1877.²⁵

Since that time many have studied the etiology of myasthenia gravis. As a result, numerous theories have been propounded, placing the primary disturbance in the endocrine system, the nerves or the muscles.¹² Metabolic disturbances and chemical imbalance have been considered of significance.¹ The fact that thymomas are frequently found in cases of myasthenia gravis has led some investigators to believe that the underlying cause is of a neoplastic nature.¹⁰

The present status of the etiology is best presented by Pritchard, who found the nerve and muscle to be physiologically normal, but found that electrical stimulation of a nerve in myasthenia gravis gave a characteristic curve placing the defect at the myoneural junction.¹⁶ He believes, together with many others, that acetylcholine plays an important rôle in the transmission of impulses across the myoneural junction. In myasthenia gravis, it is believed this chemical is diminished

by the overactivity of the choline-esterase present in the blood.^{6,15,16} Even this theory has been refuted by recent experimental work in Germany.⁹

Correspondingly, extracts of the ovaries, hypophysis and tuber cinereum have been used in the treatment of myasthenia gravis, but without success. Strychnine, adrenalin and parathormone have been tried; some have used calcium, presuming the mineral metabolism to be at fault.¹² Extirpation of thymic tumors has also been advocated as a therapeutic measure.¹⁰ Ephedrine^{7,14} was used with supposedly good results in some instances and more recently glycocholl has been advocated.³ All these substances failed to control the disease to any great extent and reportedly good results in many instances were apparently due to spontaneous remissions of the condition.

In 1934, Walker presented her method of therapy.²⁴ In a letter to the editor of the *Lancet* she said that because myasthenia gravis had been thought to be due to a curare-like poisoning of the myoneural junction, she thought it would be well to try the effect of physostigmine, a partial antagonist of curare, in the treatment of the disease. Her attempt in a single case of myasthenia gravis gave gratifying results. Later, she reported on the successful use of prostigmine, a similar, though less toxic, drug.^{13,23} The co-relationship of curare and prostigmine in myasthenia gravis was later demonstrated.⁴

The use of prostigmine by mouth was introduced in 1935 by Everts, who found that in addition to being more readily administered, its effect was more prolonged and with fewer untoward reactions.⁸ Several investigators have felt that the use of prostigmine was

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dangerous because of its toxic effects, and have advised against its oral administration until more is known of its fate in the gastro-intestinal tract.^{2,31} However, the men who have used it the most, notably Viets and Schwab and their co-workers, feel that in myasthenia gravis the toxic effects are not a serious hazard.^{19,20,21,22}

The drug to be administered by mouth is supplied in 15 mg. tablets and the dosage must be individualized to get the best therapeutic effect without injurious side effects.^{6,18,22} Its action is apparently enhanced by the addition of ephedrine as was recently shown by Viets and Schwab in a study of forty-four cases, in 41 of which ephedrine increased the effect of the prostigmine.²² Schafer used benzedrine as an adjunct.¹⁷

In the past twenty years the diagnosis of myasthenia gravis had been made but three times at the Minneapolis General Hospital. The first case was that of a patient who apparently had a spontaneous remission after symptomatic treatment only and has not been heard from since (thirteen years). The second patient expired before therapy could be instituted. The case presented here is the first to be treated with prostigmine at the Minneapolis General Hospital.

Case Report

Mrs. C. H., a thirty-four-year-old white woman, was admitted to the hospital on August 31, 1939, giving a history of progressive generalized weakness for three to four months and cough and fever for three days. For the preceding three months she had become progressively weaker. She seemed quite rested and was able to do her housework in the morning, but by evening she was "all tired out"; after walking a block she became so exhausted she had to stop and rest; after eating part of her meal, she had to use her hand to assist her jaw; and ptosis of her upper lids had become pronounced. For three days prior to admission, the patient had had fever with increasingly severe dyspnea, dysphagia, ptosis and cough, with inability to raise sputum.

Review of her past health revealed that the patient had congenital hemolytic jaundice, confirmed by laboratory studies; and that in January, 1938, after a severe, acute exacerbation of the jaundice, her spleen had been removed. She was seen in the Minneapolis General Hospital on two other occasions with findings of acute cholecystitis and cholelithiasis, but no mention of symptoms of myasthenia gravis was made until March, 1939, when it was noted only that "patient says she becomes very weak at the end of the day." In retrospect, the patient claimed to have had diplopia as early as November, 1938.

Physical examination revealed a critically ill patient almost moribund, very cyanotic and dyspneic with marked ptosis of both lids, dysphagia and dysarthria. Blood pressure was 120/70. A diagnosis of myasthenia gravis was made and at 2:40 A. M. 3 c.c. of 1:2000 solution of prostigmine methyl sulfate (1.5 mg.) and atrophine sulfate (gr. 1/150) was given intramuscularly. By 2:50 A. M. all the symptoms objectively and subjectively had either disappeared or had remarkably improved. She was able to cough and expectorate, to speak distinctly, to eat and drink, and her respirations became easier with disappearance of the cyanosis. The patient stated that she had not felt so strong for weeks.

Her temperature was 102° and there was evidence of consolidation in both lower lobes on physical examination and on x-ray study of the chest. No thymic enlargement could be demonstrated. Sulfapyridine therapy was started, the patient getting 4 gm. daily for five

days; and she was placed in an oxygen tent for twenty-four hours. By the seventh day her temperature was normal and remained so.

The effects of the prostigmine lasted until 8:00 A. M., at which time the symptoms had recurred and the same dose was repeated with the same startling results. She was then started on prostigmine bromide by mouth augmented with ephedrine hydrochloride. The dosage was 15 mg. every 2 hours from 8:30 A. M. to 10:30 P. M. with ephedrine hydrochloride gr. $\frac{3}{8}$ given at 7:30 A. M., 10:30 A. M., 4:30 P. M. and 8:30 P. M.

For the next few days it was necessary to augment the oral medication with the intramuscular drug on several occasions. By September 6, 1939, the signs and symptoms had almost entirely disappeared and the patient was up and about the ward. The dosage was then gradually reduced so that by September 21, 1939, she was taking but 30 mg. of prostigmine bromide daily together with four doses of ephedrine hydrochloride. However, on the dosage the patient developed diplopia, dysarthria and dysphagia; while on 3 tablets daily these symptoms disappeared again.

Laboratory studies revealed a normal urine, a hemoglobin level of 78 per cent, and white blood count of 37,500. Blood calcium was 11.5 mg. and phosphorus was 4.6 mg. Plasma chlorides were 276 mg. per 100 c.c. The blood Wassermann test was negative; the icterus index was 12. The average red blood cell diameter was 7.2 micra, and increased fragility of the red blood cells could be demonstrated. Urine chlorides were 2.04 gm./100 c.c. Sputum on admission revealed type 28 pneumococcus. Basal metabolic rate, electrocardiogram and spinal fluid were all normal.

The patient was discharged on September 23, 1939, asymptomatic, taking 15 mg. of prostigmine bromide at 10:30 A. M., 4:30 and 8:30 P. M. together with 1 capsule of ephedrine hydrochloride (gr. $\frac{3}{8}$) each time. Since then she has been followed in the Out-Patient Department and when last seen, three months after admission, she had gained fifteen pounds in weight and was free from symptoms. On our suggestion she discontinued the drug on one occasion with prompt recurrence of the syndrome.

Conclusions

A case of myasthenia gravis is reported in which prostigmine bromide by mouth combined with ephedrine hydrochloride is being used effectively.

The case is further of interest because of the history of congenital hemolytic jaundice and splenectomy. The congenital hemolytic jaundice preceded the myasthenia gravis.

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HISTAMINASE IN THE TREATMENT OF URTICARIA OF PREGNANCY

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THE use of histaminase in the treatment and prevention of allergic signs and symptoms has received a great deal of attention recently. The theory is that the release of histamine in the tissues is the immediate cause of the phenomena of allergy. The result of treatment as well as the theoretical basis for it has been reported with varying results in the literature. Best¹ showed that lung and other tissues when suspended in saline solution and incubated in the presence of toluene at 37 C caused the disappearance of natural or added histamine. Best and McHenry² also noted that there appeared to be a marked relation between histamine shock and anaphylactic shock. The substance which produced the disappearance of histamine is thermolabile and in 1930, Best and McHenry³ suggested the name histaminase. They stated, however, "Since it has not been established that histamine is the causative agent in any pathological condition there would be no obvious clinical application of histaminase, even if it should be established that the ability of an organism to inactivate histamine can be increased by administration of the enzyme." Laymon and Cummings⁴ in a recent publication of a presentation before the Society for Investigative Dermatology came to the conclusion that histaminase is apparently of value in some cases of allergy, though they could not attest to any specificity. Dr. C. W. Laymon, in a personal communication, states that he is himself convinced that histaminase is very useful in many cases of urticaria where other methods have failed. Miller and Piness,⁵ on the other hand, in a later publication, came to the conclusion after treating forty-two allergic patients including twenty-eight with urticaria, that histaminase failed to give unequivocal evidence that this enzyme was responsible for the relief or prevention of any signs or symptoms of which the patients complained.

Karady and Browne⁴ in 1939, however, recorded a successful attempt to neutralize the action of histamine in the guinea pig by using histaminase (Winthrop).

In the case presented here, the histaminase used was that manufactured by the Winthrop Chemical Company and called by them "Torantil." The product is dispensed in tablets and is said to be derived from hog's kidney, the unit of activity being "the amount which will inactivate one mg. of histamine hydrochloride during incubation at 37.5 C. for twenty-four hours." These tablets containing five units each are to be administered before meals and with one glass of water. The usual dose recommended is from five to ten units three to four times daily.

The patient presented here is a white woman, thirty-one years old, whose last menstrual period was July 26, 1939, and who therefore was due to deliver about May 2, 1940. She is a primipara, 5 feet 4 inches in height and her usual weight has been 112 pounds. She gave no history of any previous skin abnormality. She has a history of a mild degree of hyperthyroidism which had been treated by x-ray with apparently good results so that she has no symptoms referable to her goiter at present. Her basal metabolism has been normal for several years. She had taken iodine occasionally because she said it made her feel better and she had continued to take a few drops of Lugol's solution at times, throughout her pregnancy. There is no past history of allergy of any type and she had never had any skin lesions. Her family history is negative except for a history of a twin pregnancy by her mother's sister.

The patient's physical condition when first seen was good and that of a normal pregnancy although the possibility of twins was suggested due to the large size of the uterus. Her weight was 133 pounds, blood pressure was 120/80, her pulse rate 90, fetal heart rate 140. Urine was normal. Hgb. 90, r.b.c. 4,200,000, w.b.c. 7,000, Wassermann negative. Measurements were normal.

The pregnancy was uneventful in all respects until February 17, 1940, when a small area of redness developed about the vulva with a very annoying itch. The itching increased very rapidly and the urticaria spread until it covered the whole body. Elimination diets, stopping of iodine, starch baths, ultraviolet ray, anti pruritics of any and all kinds and intravenous sodium thiosulphate were tried and to no avail. Sedatives, in-

(Continued on page 824)

HISTORY OF MEDICINE IN MINNESOTA

DISEASES OF THE DAKOTA INDIANS*

By THOMAS S. WILLIAMSON, M.D.

(Continued from the October issue.)

During those years I saw several cases of croup, one of which proved fatal; but I do not remember to have seen a well marked case of it among Indians since. Influenza was endemic every winter, generally beginning very soon after those who had been away hunting and living on animal food returned and began to mingle with those who remained in the neighborhood and subsisted almost entirely on corn and potatoes. As there was always much feasting at such times, I at first attributed it entirely to over eating, and still think this may have had something of a causative nature, but those who made no change in their diet at such times did not escape. I observed that all persons connected with the mission, i.e., white persons from the States, were exempt from this influenza the first winter and generally had it lighter than others the second; after which they suffered about the same as the others. I am not aware that the disease ever proved directly fatal there, but it induced other diseases that did.

Except from this influenza, which seldom prevailed for more than a month at a time, the Indians, notwithstanding their scant clothing, suffered much less from what are usually called colds than white people, and this I think was owing to their scant diet.

Almost every year of my residence in Minnesota I have seen several cases of paludal disease, but during the first ten years of my residence at Lac qui Parle I saw only one such in that region which proved fatal. This, like most of the others, had its origin in the swamps of the lower Minnesota and Mississippi. Little Crow, afterwards so infamous, visited Lac qui Parle in the spring and took with him on his return to the village below Saint Paul (i.e., where it now stands) a young woman who returned to her parents during the summer and soon after was taken down with remittant fever. I was called to see her and had no doubts as to my ability to administer such medicine as would, with the blessing of God, remove the disease—but I could not conscientiously do this while the conjurers were pow wowing over her; and a young man to whom her younger sister had been given as a fee for doing this refused to give way to me—so she died, as I expected she would under such treatment.

The summers of 1845 and 1846 were warmer than any for a long time previous, in Minnesota, and hence there was a great increase in such diseases as are caused by decaying vegetable matter. During the autumn of 1845 many of the children suffered from cholera infantum, dysentery and fever; and during the following winter several aged persons died of intermittent fever; these I suppose might have recovered under proper treatment, but I had little quinine and it was impossible to get more; they also lacked animal food and good nursing, as their friends were, most of them, absent on their fall hunt.

In the autumn of 1846 there was more sickness and more deaths from the same cause, but how many I cannot say as I saw but a small part of the sick; for during this same autumn at the request of the Indians of Little Crow's village and

their agent I removed from Lac qui Parle to their village, a few miles below Saint Pauls. I have been thus particular as to the Indians at Lac qui Parle, for two reasons: first, notwithstanding the great lapse of time I have a much clearer remembrance of their condition, sicknesses and deaths, than at a later period; second, I had an opportunity of studying them at that time in their primitive condition, living without bread, pork or salt, such as has occurred to few physicians, and is not likely ever to occur again.

Notwithstanding the prevalence of scrofula and much suffering from want of food and clothing, if it had not been for violent deaths they would have increased in numbers nearly as fast as our own white population. I saw at times many of the Indians of the plains who subsisted at most times entirely on buffalo meat, they generally appeared real healthy with the exception of sore eyes. Scrofula is certainly less prevalent among them than among such as subsist almost exclusively on vegetable food, and until the buffalo began to fail they were increasing rapidly, in spite of the occasional ravages of small pox and measles.

I will here mention some of the causes of phthisis among the Dakotas; I have already mentioned scrofula, and alluded to the principal cause of that, hence it is not necessary to say more about that disease. Next is over exertion in order to obtain a subsistence. It has been often said and most people believe that the Indians lead a very easy, lazy life; but this is far from true. From the time I came to Minnesota until twenty-one years ago the Indians of this State depended for a subsistence chiefly on hunting; though most of them raised some corn, which, at certain seasons of the year, was the principal, and sometimes the only, food. Hunting may be very pleasant to those men who engage in it only for recreation, but it is hard and unpleasant as work. Near Lac qui Parle there were few or no deer and the principal animal food was wild fowl, which were obtained chiefly in the fall and spring when the water was little above the freezing point, and the hunter after walking from one to twenty miles to a sheet of water where ducks were plenty waded in among the tall grass and stood in water often knee- and sometimes waist-deep for hours to get a fair chance at a good flock. His ammunition cost him so much he could not afford to shoot at fowls on the wing or at long range, for each charge of his gun cost him at least as much as the amount for which one duck would sell. If he were so fortunate as to shoot his game without wading, still in most cases in order to get it he must wade into deep water and sometimes swim; and when it was secured he frequently had to carry it ten or fifteen miles over a bleak prairie, with all his clothes, except his blanket, wet, and often stiff with frost. A few deer were killed during the summer within ten to twenty miles of the villages on the Mississippi and lower Minnesota, but each of them usually cost many days' walking through thickets. The principal deer hunt was in autumn and early winter, when from fifty to one hundred families went together, for smaller parties would be cut off by their enemies. In such expeditions, besides their clothing, bedding, wooden dishes, each woman's work-bag, and children unable to walk, it was necessary to carry for each family a skin tent weighing from forty to one hundred pounds, an iron kettle for boiling their food, an ax, a hoe for leveling the ground where the tent is to stand, and some food, as not unfrequently no game was killed for a day or two. The country to be hunted over and the place for the next encampment having been determined on the night before, as soon as it is light hunters start, each carrying his gun, ammunition, apparatus for making fire, knife and a small hatchet. The mistress of the family packs and binds in bundles the tent and its contents assigning to each member of the family his portion of what is to be carried, taking

the heaviest burden herself, unless the family owns a horse, in which case that takes the largest share, and she the next, each still carrying something. Many families had no horse and in those the burden of each woman in middle life did not average less than 100 pounds, and sometimes much more; this was usually carried from four to ten miles a day, averaging about six. Sometimes when a wide prairie without a camping place was reached, or a scare from enemies occurred, their loads were carried from twenty to thirty miles in a day and part of the night, and this through woods or the long grass of the prairies.

You will not think it strange that such taxing of the muscles and nerves should bring on phthisis, sometimes by mere exhaustion, but oftener by causing hemorrhage from the lungs.

It was supposed and said by persons casually passing through the Indian country that the men had a much easier time than the women, and it is true that, as is the case among civilized people who labor for subsistence, the men had more time to rest than their wives, that is, were oftener idle. In hunting, however, the toil of the men was more exhausting than that of the women. The deer hunter was often unsuccessful after having run forty or fifty miles without a road or having tasted food, while if successful in killing a deer it was generally after chasing it many long miles; and, being obliged to bring in the whole carcass, his load was frequently much heavier and he had farther to carry it than any of the women.

Cases of hemoptysis were more frequent among men and more of them died from diseased lungs than the women. The life of those who subsist on buffalo was very different as they had many horses, but among them, too, the young men often suffered severely, first in finding the buffalo, and next in killing them. As their clothing is made almost entirely of buffalo skin, which is too stiff to allow of free motion of the parts it covers, they were accustomed to chase the buffalo on horseback, even in the coldest weather of winter, with their arms and all the body above the belt entirely naked. These dwellers on the prairie when near buffalo were generally fine and healthy, but when they could find none of these animals suffered even more from starvation than the other Dakotas. This suffering from lack of sufficient food is another cause of phthisis.

Having assigned the causes of the prevalence of this disease among the Indians, I might here close my already long communication, but will mention some other facts which will be interesting to you.

As above mentioned, I moved to Kaposia, an Indian village six miles by the river below Saint Pauls, in the autumn of 1846. During the winter I was called to see several genuine cases of ague, and a much larger number of abnormal cases of paludal disease; and here I will state that this disease which used to be called bilious fever is much less regular in form in Minnesota than it was in Ohio when I practiced there. Usually there is much less of what is called fever, that is of heat and arterial action and often the chill or sweating stage is scarcely perceptible; so that, though readily recognizable by persons familiar with it, even regular physicians who know it merely from description in books are very liable to mistake it for some other disease. Since I have ceased to practice medicine I have seen several instances of this, two of which proved fatal, as appeared to me, in consequence of this mistake. The summer of 1847 also was unusually warm and cases of paludal disease were numerous, both among whites and Indians in the country near Fort Snelling. The Dakotas suffered most because, like our British ancestors, for security against their enemies they had made their villages in the midst of swamps, and also because they lacked food. Government usually

gave them their flour and pork in the month of June, but that year it was withheld for a month or two, and many of them died in consequence. In health they could have subsisted on roots, chiefly of sagittaria, obtained from swamps, and on wild ducks, pigeons and fish. But the stomach of the sick rejected fish and pigeons; and it often happened that when a man, after wading in swamps for hours, returned with ducks, or a woman with roots, he or she would fall down in a chill. The food brought home was speedily prepared, but the bringer, in a chill or fever, could take no portion of it then, and before the fever was gone and appetite had returned some hungry child had eaten all the food.

I suppose a majority of the Indians were more or less affected with the disease, and about one in thirty died of it. Many more would have died but for food given them by their white neighbors, and probably four-fifths of those that died might have been saved by proper food and medicine. Subsequent summers were cooler, more healthy sites were selected for some of the villages the next year, and there was less of the disease, and subsequently but little.

Some years later these lower Sioux, as they were called, suffered severely from whooping cough in the spring and early summer. To the children who were brought to me soon after the attack, I gave small doses of tartar emetic for the first two weeks, keeping their stomachs a little irritable so that when the cough came on severely they would vomit a little. Later in the disease when they became feverish or the stomach so irritable as to reject necessary food, I gave laxatives, and of those thus treated I think not one died. At other villages the mortality was considerable. I was taken to see the sick after more than twenty had died, out of a population of about 400. On examining the little sufferers it was manifest they were perishing for lack of nutriment; and on inquiry I found that the whole village had for some time been subsisting solely on fish, and whenever a paroxysm of coughing came on they vomited what had been eaten. Medicine could do but little for them, so I told the chief to call together his principal men, told them all to look at the sick children and gave them a severe scolding for letting the children starve. When they pleaded poverty as an excuse I told them to send all the young men immediately to hunt deer, and for the older ones to go to their traders and get corn, flour and sugar for the children. They did as I directed and very few died afterwards.

Similar treatment was less successful when the disease prevailed in winter, because it was impossible to keep the patient comfortably warm.

DAKOTA MEDICINE*

By REV. THOMAS S. WILLIAMSON

AMONG the Dakotas, as among other heathen races, the offices of physician and priest were, for the most part, united in the same person. This being the case, it is not strange that their pathology should be shaped by their ideas of the spiritual world. Supposing every object, artificial as well as natural, to be the habitation of a spirit capable of hurting or helping them, and that all diseases were caused by some one or more of these spirits taking possession of a part or the whole of the body of the patient, to determine the name and nature of the spirit causing the trouble was regarded as the first business of the physician or *con-*

*From "Tah-Koo Wah-Kan; or The Gospel Among the Dakotas," by Stephen R. Riggs, 1869, p. 435.

jurer, as we usually call the medicine man of the aborigines of our country. This he attempted, not only by observing the symptoms, but by incantations addressed to the spirit or spirits which were the special objects of his worship, and expected on that account to befriend him.

The second business of the medicine man was to drive out the intruding spirit. This was attempted by all kinds of horrid noises and gestures, not omitting to call upon his god or gods for assistance. He also, in most cases, applied his mouth to the skin of the patient near the diseased part, and, after sucking for some time with all his might, would put his mouth in water kept in a vessel usually made of bark for that purpose, and blow into the water the phlegm, mucus, or blood, which he pretended to have drawn from the seat of the disease through the skin; but in most cases they doubtless came from his own mouth or throat. In many cases he would also introduce through his mouth into the water a small pebble or shell, which he would show as evidence that he had extracted the offending cause of the disease through the skin. As in this work, by shrieking, screaming, groaning, shaking his rattle, stamping and other threatening motions, the conjurer exerted all his strength, it was customary, even in cold weather, to divest himself of all clothing except his breechcloth, moccasins, and leggins; and the latter, instead of being bound about his legs, hung trailing from his ankles.

When medicines are administered, their efficacy is attributed to the god or spirit residing in the plant, rather than to any mechanical, chemical, or other power inherent in the medicine itself.

The number of practitioners is large, in some villages not less than one man in ten and one woman in thirty. Among them are to be found some of the shrewdest, strongest intellects, and a very large proportion of those who are only one step above idiots. A proper idiot I have never met among Indians, probably because such are left to perish in infancy; but the proportion of those who make an approach to idiocy is much greater among savages than among civilized people; and a large part of these are applied to in cases of sickness. Many of the conjurers are known as such by that peculiar cast of countenance which belongs to the spiritist of civilized nations; others have countenances strongly indicative of cunning and deceit. I have met two or three men among them of good, plain, common sense, and open, honest countenances. The most eminent of these, when on a certain occasion he came to me for medicine for a disease brought on by over exertion and exposure in the practice of their orgies, on being charged with deceiving his people, acknowledged the charge, and excused himself on the ground of his poverty and his need of the promised reward, and the number and urgency of those who applied to him to show them by his incantations how and when they might find and destroy their enemies.

There are a few individuals who give medicines without conjuring or invoking the aid of spirits. I have known one such who attained a deservedly high reputation among his own people and was sometimes called to practice among the whites. With intellectual and perceptive faculties strongly developed, and such knowledge of the powers of roots as is attainable among his people, naturally polite, and very observant of all those little things which contribute to the comfort of a patient, I have often thought he might have acquired fame and money among civilized men, if he had not justly preferred to live among his own people and do what he could for them.

The medicines used by the Dakotas were mostly roots, and their name for a physician, Pay-zhe-hoo-ta-we-chashta, Herb-root-man. They, however, used not only other parts of plants, but sometimes animal and mineral substances. In

general their medicines were all secret, the knowledge of them concealed as far as possible from each other, except in cases where large fees were paid by such as were not likely to become rivals in the same community, or where an individual not expecting to practice his profession much longer, owing to age or infirmity, might communicate to some descendant or other near relative the knowledge which he possessed. This disposition to conceal their knowledge, so prevalent among quacks, not less than the want of books, prevented the transmission and accumulation of knowledge; so that if any important discoveries were made, they were liable to perish with the discoverer.

With such false pathology and such hindrances to the transmission of knowledge, we could not expect that the sick would be much benefited by the medicine men. So far as I have had an opportunity of observing their practice in cases of fever and some other diseases, with very few exceptions, they did more harm than good. But I know of no way of accounting for the high value set on their services without supposing that, in many cases, they gave relief. My observation inclines me to think that this occurs especially in wounds and pains from local inflammation more frequently than we should expect from what has been said above.

The perceptive faculties among the Dakotas are far more acute than among civilized men. The successful medicine man, like the successful warrior, attains to the highest honor, and is more sure of getting property largely, than either the warrior or hunter; and thus his faculties are stimulated to the highest degree of activity; and having usually only one patient at a time he can observe more closely the effect of the medicine he uses. Some of this class are excellent nurses of the sick, and most attentive to all those thousand little things so conducive to the comfort of their patients. The family is removed from the tent, or the patient and tent from them; and the ground which constitutes the floor of the tent is carpeted, in summer, with ferns or other soft herbage, and scented with aromatic herbs, and, in seasons of the year when these cannot be obtained, with the best substitutes for them accessible. Some of the medicine men watch their patients very thoroughly, and to prevent noise exclude children, and in many cases women too, unless the nearest relatives.

They practice blood-letting, which with them is an operation generally performed with a sharp flint which serves very well for scarifying. When a vein is to be cut, the flint is made fast in a stick, which serves as a handle, and, like a fleam used in bleeding horses, it is driven in with a stroke. As this is a difficult operation, few attempt it; but local blood-letting is very common, the operator usually drawing the blood directly into his own mouth. Some, however, use a horn, or a part of one, applying the large end to the surface whence the blood is to be drawn, and taking the smaller end, which is perforated, into the mouth.

They attribute many of their diseases to bile, or "yellow water," as they call it, and for its removal use emetics, purgatives, and clysters. Most of them, however, freely acknowledge that none of the native remedies for certainty and safety equals those used for purging and puking by civilized men, since to secure vomiting the Dakota doctor is commonly obliged to tickle the throat with a feather.

For purging, the Dakotas who lived near the Mississippi, in common with their eastern neighbors, the Ojibwas, relied chiefly on the root of a tall and very handsome species of euphorbium which abounds on the prairies between Saint Paul and Red Wing. Coarsely powdered it is administered in small quantities, and it operates quickly and often severely. They say it is safe if used dry and the patient abstains entirely from drink until the operation is over, but very dangerous

if the patient drinks freely soon after taking it. The Ojibwa chief, Firm Earth, the predecessor and older brother of the first Hole-in-the-Day, who died near Fort Snelling in 1843, was said by his companions to have come to his end by drinking freely after taking a dose of this root. He died in a few minutes after walking about, and apparently from the effects of acrid poison. The plant is not found on the Upper Minnesota or farther west, and consequently I have had but few opportunities of witnessing its effects. The Indians who have not access to it, use various other plants, none of which appears to have much efficacy. The same may be said of those used as diuretics.

To promote appetite, especially after fevers, they used cranberries, preferring for this purpose the fruit of the tree cranberry, and sometimes substituted bitter aromatic roots.

Sweating in a small tent, over heated stones, was a frequent and perhaps their most efficacious remedy for the removal of disease. It was resorted to not only in cases of pain and sickness, but as an antidote or purifier by those who had killed any person, or otherwise contracted ceremonial uncleanness. The process is described elsewhere.

Contrary to what might be expected, many of them use anesthetics. I have frequently heard of persons reviving after being apparently dead, and seen several such who appeared very much as is common with those who are recovering from the effects of an excessive dose of opium, who nevertheless, I have good reason to believe, had not taken it. In consequence of the conjurers interfering with some of my own patients, I had an opportunity of observing one or two in the state of anesthesia. It is caused by making the person inhale the fumes of calamus roots, and some other substances, burnt on coals. Whether the effect is produced by the calamus or some of the other ingredients, or by the combination, I am unable to say. This state is sometimes produced for the purpose of allaying that extreme restlessness which attends some diseases, but chiefly, I suppose, that the practitioner may have the credit of restoring a dead person to life.

The Dakotas were far more successful in the practice of surgery than medicine. Their constant practice in cutting up animals slain in the chase, made many of them well acquainted with comparative anatomy. Yet their ignorance about the circulation of the blood caused them to lose patients, who might have been saved by a judicious use of bandages, or the entire removal of them. They use tents to keep open deep wounds or abscesses, and prepare good ones for the purpose from the inner bark of the slippery elm. They sometimes apply wet dressings to wounds or sores, and cover them with green leaves, either fresh or boiled; but not possessing the materials for making poultices, plasters, or cerates, they generally endeavor to dry up and scab over wounds and running sores. Sometimes they cover the raw surface with a paste made by chewing certain roots, bark, or leaves. At other times the medicine is reduced to a powder and dusted over the sore. A variety of substances are used for this purpose, among which none is more highly esteemed than the root of the *Asclepias tuberosa*, a species of milk-weed. This is also sometimes given internally.

To reduce swellings, especially those arising from sprains or bruises, they apply various stimulating vegetables, including tobacco. Among these they most value what they call *blue root*, a species of pyrethrum very common in the prairies of Minnesota and Dakota.

A few of them are skilful in the treatment of burns, but this is not generally the case. Commonly they apply oil or grease of some kind, when it is to be ob-

tained, and carefully conceal the knowledge of the other remedies they use. I once saw an excellent effect produced on a very extensive and severe burn, by covering the entire raw surface with the inner bark of the yellow, or, as it is called in Minnesota, the Norway pine. The bark had been shaved thin and made soft by beating it, and the inner mucilaginous surface applied, which allayed the pain and inflammation. I do not think any of the medicines of the shops could have a better effect.

When suffering from disease they will, with few exceptions, gladly avail themselves of the services and medicines of regularly educated physicians, and the conjurers not less willingly than others; although they endeavor to prevent others from doing so, claiming that their medicines are superior to the white man's.

FREE MEDICAL CARE

The man in the street may not understand how political medicine would lower the quality of medical care he receives but he certainly can understand taxes. And when he is told that the cost of such a program would amount to between 10 per cent and 15 per cent of the national payroll he can begin to see the joker in back of this promise of "free medical care."

During a recent session of the New York State Legislature, two bills were introduced which give us an idea of what we may expect if our busy propagandists succeed in foisting this scheme upon an American public deceived by false promises and unacquainted with the true facts.

These bills were alike in all essential details; both bills would have vested the control of medicine in a group composed predominately of laymen and entirely under political control. The medical representation provided would have been such a small minority as to have negligible power and although the bills provided for a professional advisory board, such a board would have had purely advisory powers with absolutely no authority to enforce its recommendations.

Of course nothing in this world is free and in the case of compulsory health insurance, the staggering bill would have to be met by the very people whom the bill is supposed to help. Although workers earning less than \$20 a week were promised complete medical care for only \$10 a year, the resulting deficit would have been made up by taxes on workers earning not much more. For example, salaries between \$20 and \$40 a week would be taxed up to \$41 a year; between \$40 and \$60, up to \$92 a year.

Even this would not be an intolerable load if it represented the entire cost, but the bills provided for a heavy tax upon the employers, which tax would of course have to be passed on to the workingmen either in the form of lower salary or in the form of higher prices for the commodities they manufactured, and then the deficit still remaining would be made up by general taxation, either direct or indirect, and everyone who is capable of any thinking at all understands that all taxes are ultimately paid by the man who works for a living.

—*Nassau Medical News.*

President's Letter

OUR GREAT TASK

THE American method of practicing medicine has developed the greatest advances in medical science and knowledge and has brought these to a larger proportion of the entire country's population than ever before in history. Never before has the whole population of any country received such efficient medical care as this country now enjoys. All the recent discoveries, inventions, and new developments that can aid medical care are being utilized; in addition to this, continuous experiments are being conducted in the endeavor to discover better methods of fighting disease.

During the past quarter of a century changes in every phase of life and knowledge have taken place; these changes have been slow enough to be regarded as an evolution and people have been able to accustom themselves to the new conditions without too great difficulty. But with these changes new ideas have been disseminated which are revolutionary in character and which if put into effect would completely change the manner of living of entire groups of our population. Experimenters, dreamers, and radicals, each with his peculiar ideals and theories, offer their ideas in alluring and enticing style and each would revolutionize the world. Among these theories Compulsory Health Insurance under government control, or Socialized Medicine, as it is often called, has been presented, in the rosiest and most attractive manner possible by large and powerful groups. Those who advocate it are either misinformed, ignorant, or actuated by selfish and ulterior motives. They would tear down and utterly destroy our established American system of medical practice and substitute for it the European system.

Should such a change be accomplished, not only will progress in medical science and knowledge be greatly retarded, not only will the initiative and ambition of the physician to advance in skill and knowledge be removed, but the status of the physician will be greatly lowered, his work reduced to drudgery, and his chosen profession will offer him but a bare living. Worse than that his opportunity to be of the greatest service to his patients will be curtailed. All of these things have been said before; but they are so vital to the public welfare that they must be repeated.

Since time immemorial we have been taught that the physician should not enter into the field of politics, that medicine and politics cannot mix, that the bickerings of political life will ruin the practice and usefulness of any doctor, however learned and clever. But times and conditions have changed. One need but consider the proposed bills introduced into our various legislatures and in Congress, or read the speeches and addresses of men high in legislative and executive positions in our national government to realize that this threat is serious and imminent. The radio broadcasts sent out in the past two or three months by the Department of Interior in Washington show what is going on under Mr. Ickes' direction. With but little regard for truth and no thought of how impossible or wasteful their schemes would be, they would have the people believe that all the ills of humanity could be cured by political control of medical care.

Unless we physicians enlighten the people, politicians will soon force government control of medical care upon us. It is high time for us to act. We can no longer remain an inarticulate group. However distasteful and no matter how difficult it may be for us as individuals to enter into this struggle, we must each take an active and energetic part or we shall all lose. We have allowed ourselves to remain in obscurity too long; it is time for us, now, to express ourselves and to do it forcibly and effectively. We must take an active part in public affairs and we must let people know that medical matters are vital and important to them. If we wish to retain our American way of practicing medicine we must let the public know what the European system is like, what its results are and what they can expect from such a system. Every physician has friends and patients who trust him and who believe in his honesty. He must talk frankly to these people. The time has come when the medical profession must speak, not only in its own defense, but in the defense of the people who are easily misled to their own hurt. We should do this, not by argument or vituperation, but by calm statements of fact. As Dr. Andrew H. Smith told the New York Academy of Medicine: "The world has a right to know, and it is our duty to tell, just what progress we are making day by day, the steps by which results are obtained, the difficulties we meet, the uncertainties still to be cleared up, the problems which are pressing for solution." If we can gain the confidence of the public and help them to understand what it would mean to bring the European system to this country there would be no need for worry. To bring about this understanding is our great task.

BERTRAM S. ADAMS, M.D.

President, Minnesota State Medical Association

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

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HISTORICAL HIGHLIGHTS ON APPENDICITIS

AS Treves has well remarked, discussions
on the question of priority constitute the
most pitiable and petty items in the literature
of medicine. Any claim to priority in medi-
cine or surgery rests not upon the date of per-
formance but upon the date of publication
(Kelly). However, the credit for a new pro-
cedure should go not to the person who mere-
ly first did it or wrote about it, but to the
one who "put the idea across."

It seems incredible that the true nature of a
lesion so obvious to us now as appendicitis
should have been unrecognized for so long.
In 1753 Heister first demonstrated at necrop-
sy lesions occurring in the appendix. From

the time of Mestivier of France, who in 1759
first operated upon an appendiceal abscess, un-
til Fitz's paper in 1886, there were occasional
reports on appendicitis in the literature, stud-
ied with amazing detail and skill, but the ob-
servers failed to trace the true origin of the
disease. In 1827 Mélier, a French physician,
presented a clinical description of appendicitis.
However, Dupuytren, the leading French sur-
geon of the day, disagreed with some of Mé-
lier's statements and held him up to ridicule.
Mélier retracted his statements and, as a re-
sult, advancement in the knowledge of appen-
dicitis was held back for 50 years (Collins).
In 1880, Goldbeck and his school advanced the
theory that the primary disease lay in the ce-
cum and not the appendix. They advanced
the terms "pertyphilitis, epityphilitis and en-
dotyphilitis," which confused rather than clar-
ified the situation. While Addison, Bright
and Volz described the typical lesion in appen-
dicitis, the credit for recognizing the true
pathological nature of this disease belongs to
Fitz (1886) who also gave the disease its
name, appendicitis.

The surgery of appendicitis dates back about
a century. Excellent reviews have been given
by Collins and Kelly. According to Kelly the
earliest efforts of the surgeon in the treatment
of this disease consisted in opening a few ab-
scesses and then gradually making the in-
cision before the detection of fluctuation (Han-
cock, 1848; Willard Parker, 1867). With the
dawn of antiseptic surgery, a few surgeons
ventured to open the peritoneum, to straighten
out a kink of the appendix (Treves), to trim
off the edges of a fistula in the appendix
(Sands), and at last to remove the entire or-
gan (Krönlein, Morton, Sands). To Thomas
G. Morton of Philadelphia belongs the cred-
it for the first appendectomy, deliberately un-
dertaken with the diagnosis of acute appendi-
citis. In stressing the need for the early diag-
nosis and treatment of this disease, the names
of Fitz, Price, Morton, Fowler, McBurney,
Richardson, Morris, Murphy, Ochsner and
Deaver deserve mention. To McBurney more
than to any other surgeon belongs the cred-

it for crystallizing our ideas regarding the treatment of this disease. His paper entitled "Experiences with Early Operative Interference in Cases of Disease of the Vermiform Appendix", published in the New York Medical Journal for December 21, 1889, is a classic in the treatment of acute appendicitis. The subsequent years have not brought any important changes in his ideas of treatment.

It is interesting to note the cause of death of some of the investigators of the problem of appendicitis. Fowler died from peritonitis following a ruptured appendix. McDowell, who did the first successful ovariectomy in this country, also died from this disease. Price and Treves died of peritonitis; Fitz succumbed following an operation for chronic gastric ulcer. The etiology of the peritonitis in the cases of Price and Treves is not clear, although Price is said to have had an infection involving the retroperitoneal lymph nodes. Parker, Murphy, Ochsner and McBurney died from various forms of cardiovascular disease, the first from cerebral hemorrhage and the latter three from coronary disease. Deaver died of an obscure anemia, the exact nature of which was not determined even at autopsy. T. G. Morton died of cholera. It is noteworthy that both his brother and a son died of ruptured appendicitis, upon both of whom Morton had urged in vain the attending surgeons to operate.

It may seem somewhat surprising that the mortality of appendicitis is higher by occupation among physicians and surgeons than it is in the population at large. Whitney found that, from the mortality statistics of the United States census, the death rate for gainfully employed men (whole group, between fifteen and sixty-four years) was 20.7 per 100,000. For physicians and surgeons the rate was 22.1. Similarly, Alvarez found that medical men delay longer than lay people in seeking treatment for cancer of the stomach.

At present, the problem of appendicitis is not one of lack of scientific knowledge, but rather one of applying that knowledge effectively. Physicians would do well to apply that knowledge to themselves as well as to their patients.

CHARLES E. REA, M. D.

A SAFE SAFETY PIN

THIS product, the result of the inventive genius of Dr. Woodard Colby of Saint Paul, is 'now being manufactured and will shortly be available for general distribution. For those who have had the opportunity to use this pin, its merits are most appealing. Its construction is simple and most ingenious. The outstanding feature is the manner in which the point is concealed, making it impossible to cause injury to infants in the ordinary use to which it is put and virtually harmless if swallowed. It is to be manufactured by the Minnesota Homecrafters, Inc., under a plan sponsored by the Minnesota Department of Education and the United States Government. The pin has received the unqualified endorsement of the Ramsey County Medical Society and the St. Louis County Medical Society and of many leading physicians, among them Dr. Bela Schick of New York, Dr. Walter Ramsey and Dr. H. P. Ritchie of Saint Paul and many others.

The plan of manufacture and distribution as at present undertaken is two-fold. First, it will place a much desired article on the open market and, second, it will provide gainful employment for a goodly number of handicapped individuals. That these workers are by no means unskilled is evidenced by the fact that out of seventy-five useful articles exhibited at the Minnesota State Fair last month prizes were awarded to sixty-three. At the Tri-State Fair they received prizes for twelve from a total of fifteen shown, at the Proctor Fair ten out of twelve and at the Hibbing Fair every one of eight articles exhibited received awards.

Miss Marion Medd, Supervisor of this Homecrafters' project, informs us that a teacher provided through the Works Projects Administration visits the participating persons once a week and instructs those capable of skilled craftsmanship in the production of wood and/or metal articles. These articles are such that they can be sold on their own merit entirely and not on a sentimental appeal. Miss Medd is of the opinion that the Colby Clasp is ideally suited to this purpose because it can be completed in the home and will furnish work and income to this deserving group.

JAMES TRENT CHRISTISON, M.D.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

THE BLIND GODDESS

These are truly hectic days. Never has our American life been involved in such confusion and uncertainty as confronts us today. In the midst of turmoil the medical profession alone goes on its way, carrying on its mission of combating disease in any form which presents itself, as it has done in ages past. Conformists when necessary, but never obstructionists. So now, as emergencies arise, we change our methods to support our country's needs, making any necessary sacrifice without hesitation. All we ask is to conduct our healing art as we know it should be done and without interference from those who are not one of us. And now our shield and protection, the American Medical Association, in the midst of its efforts to support the nation's defense, is assailed by the Federal Department of Justice for daring to defy its plans for political control of medicine.

Trial Postponed

Suddenly the political element reveals itself, announcing that the trial is postponed indefinitely. And so, possibly in response to the ringing editorial which appeared in the last issue of the *Journal of the American Medical Association* and which was broadcast in the public press, the ban was suddenly lifted, at least until after election.

One would think that the terrific cost entailed in our nation's defense would stop such impractical schemes, but such is not the case. How stealthily the campaign to socialize medicine proceeds is shown by a recent attempt, under the guise of defense, to put the medical care of five million young men in the deferred list under control of federal health agencies. We, in the ranks of the Minnesota State Medical Association, can take pride in being the first to voice our opposition to this insidious

plan which, if carried out, would eventually suppress the private practice of medicine.

Sword May Be Sharper

It is no wonder that the members of the American medical profession are intensely interested in the forthcoming election and are vigorously supporting those who uphold their principles. While the Damoclean sword has been temporarily sheathed, it may be sharper than ever after election. In the meantime, it behooves every one of us to use every ounce of influence with all of those with whom we come in contact and to do what we can to protect the public welfare and the future of medicine.

MINNESOTA FIRST

The Council of the Minnesota State Medical Association is the first among responsible, executive bodies of state medical associations to go on record in opposition to free medical service for the rehabilitation of draft registrants rejected for physical defects. At the same time (as noted elsewhere in these columns) the Council went on record against the offer of Wassermann tests for all Class 1 registrants and the consequent slowing up of the defense program.

The physicians of Minnesota and of the nation are making an impressive contribution to defense preparations. They will do more, if more is asked of them; but when a welter of utopian schemes for improvement of civilian health is hastily tossed by civilian health officials into the already complicated machinery for registration, examination and induction into service of drafted men, then the physicians who will be asked to bear the burden are entitled to protest.

And when these schemes, if put into effect,

would also plunge the country into an endless program of government medical care of civilians, the obligation of physicians to oppose them is obvious.

The resolution passed by the Council at a special meeting held October 16 in Saint Paul is as follows:

1. WHEREAS, the Surgeon General of the United States Public Health Service has requested that serological tests for syphilis be given to every man who registers under the Selective Service Act, October 16, 1940, and

WHEREAS, the advisability of making the test on this scale has been thoroughly discussed with public health authorities and syphilologists in Minnesota:

IT IS HEREBY RESOLVED by the Council of the Minnesota State Medical Association called in special session on October 5, 1940, that the request to examine in this manner all registrants is impractical and inadvisable, especially in view of the emergency of the situation and the short time available to prepare for such an undertaking, and

WHEREAS, the registrants assigned to Class 1 when inducted into military service will have a complete examination at the mobilization center including a serological test:

A. It was the opinion of the Council that it would be inadvisable to duplicate such examinations for these registrants who are assigned to Class 1.

B. Since the selection and induction of men into service at this time is distinctly a military and not a public health program, it was the opinion of the Council that the procedures entailed by the test would lay an additional heavy and unnecessary burden and expense on physicians and public health services.

C. In view of the lack of organization for the collecting, mailing and testing of the specimens collected, it seemed advisable to avoid interjecting any procedure or undertaking that would complicate or in any way slow up the efficiency of the draft machinery.

2. WHEREAS, the program of the Minnesota State Medical Association and the Minnesota State Board of Health is a comprehensive one in that it includes not only syphilis but all infectious diseases, and

WHEREAS, encouragement of prophylactic and preventive medicine is part of that program,

It was the further opinion of the Council that such prophylactic measures should include prevention of venereal diseases at home and in the communities around the cantonment

3. WHEREAS, all deferred registrants under the selective Service Act still retain their civilian status.

It was also the opinion of the Council that any special testing or rehabilitation of those deferred registrants with regard to disease or disability should be carried out by the private physician with free choice of physician and hospital, thus helping to relieve overburdened military and public health facilities.

NATIONAL HEALTH PROGRAM—1940

That the National Defense program will also involve a national health program on a completely new basis seems altogether likely from the report of the September 16 Conference of State and Provincial Health Officers in Washington which was printed in *Public Health Reports* of the United States Public Health Service for September 27.

The customary cautiousness of United States Public Health Service officials in the handling of ticklish new plans for medical service to civilians was abandoned at this conference. A bright new world was envisioned. In this world, hands of the Health Service were to be freed, at last, to wipe out syphilis in the United States, to correct the physical defects of youth before they reached draft age and to rehabilitate the unfit discovered by draft board examiners—all without troublesome interference.

State medicine? Government medical service? Meaningless words now, it seemed; outmoded bogies. The mere invocation of those magic words, "National Defense" was to be enough, henceforth, to lay such uneasy wraiths.

They Took It For Granted

The surgeons of the United States Public Health Service put the problems to the conference and took for granted the answers. Of course, the program was desirable. Of course, the health service was ready to supervise, to supply funds to carry on the work. . . .

Presumably the conference acquiesced, at least informally, in the proposals made to it, though the method of securing acquiescence may have been similar to the method understood to have been used to gain backing for the astonishing proposal to offer every man who registered on October 16 a free Wassermann test for syphilis. This last-named plan was proposed to the conference by Senior Surgeon O. C. Wenger, of the Health Service.

Committee No. 2 Approved

In this case, it is understood, the regular conference committee of venereal disease was consulted first. This committee refused, because of the obvious difficulties involved, to give its approval; but its action was not al-

lowed to dampen the general enthusiasm. Another committee was promptly appointed and this second, impromptu committee approved without question. It was the report of the substitute committee that was presented to the conference.

"Discussion (of this plan) brought out a number of practical points and administrative difficulties," the health service account acknowledges, "such as the magnitude of the task to be accomplished within a very short time; the inadequate number of technicians available to perform the tests; the insufficient stock of specimen tubes and the lack of proper storage facilities for specimens awaiting examination."

According to the report, the health officers seemed anxious to accomplish "all that might be done within the limits imposed by circumstances."

Rejected for Minnesota

Actually, a compromise proposal was made by which Class 1 registrants, only, might be offered a Wassermann test. This proposal was later brought by Dr. A. J. Chesley, Secretary State Board of Health, to the official attention of the Council of the Minnesota State Medical Association for advice as to the policy which should be followed in Minnesota. The action taken by the Council at a special meeting, held, on both proposals and also on the proposal to provide rehabilitation for "culls," rejected from service, because of physical condition, is printed in full elsewhere in these columns. It will be noted that the Council did not favor even the compromise plan for several reasons, chief among them being the fact that selection and induction of men is distinctly a military and not a public health program, that testing Class 1 registrants would duplicate tests that would be made as a matter of routine at the time selectees were inducted into the service and that the procedure would place an added and unnecessary burden upon examining physicians.

The plan for providing physical examinations and correction of remediable defects among youths enrolled for benefits under the National Youth Administration was presented for approval to the Conference and has also been broached for Minnesota beneficiaries by director Chester A. Lund of Minnesota.

Youth Plans to Be Discussed

Just how the plan will eventually be conducted—if it is conducted in Minnesota—has not yet been determined. An early meeting with the Minnesota State Medical Association's Committee on Low Income and Indigent Problems, of which Dr. W. A. Coventry of Duluth is chairman, had been arranged as this issue went to press. It is altogether probable, however, that the Youth Administration will try to insist upon letting this work to the contract basis. State health departments are lowest-physician bidder in each county, on a contract basis. State health departments are to be asked to be co-sponsors in this work.

Following is the resolution introduced and, at least informally, approved by the conference on the subject of rehabilitating the men disqualified for military service because of physical defects.

To Correct Defects

RESOLVED: That persons who are otherwise found to be satisfactory and available for induction into the land or naval forces of the United States for training and service as provided by the Selective Training and Service Act of 1940, but who are placed on a deferred status because of physical defects or ailments which are readily amenable to treatment and cure may, upon application to the Surgeon General of the United States Public Health Service, be considered for acceptance as beneficiaries of that service for correction of such physical defects or ailments.

The committee contemplated, according to the report, that the Surgeon General of the United States Public Health Service would use his discretion in determining facilities, institutions and personnel to be employed in such corrective work and that any non-governmental facilities that might be used would be reimbursed out of funds made available to the United States Public Health Service for the operation of a program of rehabilitation among eligible rejected men.

Surgeons Thanked

Health of industrial workers, health and welfare of civilian populations, special public health measures involved in mobilization and in regions surrounding cantonments, education and qualifications of personnel—all these received attention and discussion.

At the end, the conference adopted a mild and non-committal formal resolution of thanks to the representatives of the United States Public Health Service, requested their con-

tinued interest and coöperation and drew attention of civil and military defense authorities to the importance of public health problems in the nation's defense.

If they did not formally go on record in favor of each resolution as it was presented, they certainly did not voice any objections—at least no objections were reported in the United States Public Health Service publication. The reason was, of course, that the object of the conference was not a new health program; instead it was national defense. And what social dreams if properly interpreted, cannot be tethered to national defense?

MEDICAL INDUCTION BOARDS

Profiting by experience of 1917, every man accepted for military service under the Selective Service Act of 1940 will be given a careful final physical examination by an Induction Board of specialists before he is assigned to cantonments or camps for training.

Tentative selections for appointments to Minnesota's board have already been made by Army Medical officers in consultation with medical association officials. All boards are to be made up of three internists, one general surgeon, one orthopedic surgeon, two ophthalmologists, one otolaryngologist, one neuropsychiatrist, one clinical pathologist and one dentist, including probably both civilian specialists and reserve officers on temporary duty.

From nine to twelve of these boards will probably be needed for each corps area; but it is understood that only one will be needed for Minnesota and immediate vicinity. Headquarters for this board will be at Fort Snelling.

Service Temporary

Specialists selected will all be on temporary duty. They will probably serve for an estimated period of about a month following each selection of drafted men and they will probably be paid at the same rate of base pay as a major in the regular army, with allowances for travel and subsistence while on duty. Whether they will be required to be on duty for an entire eight-hour day or only for a part-time period each day had not yet been decided as this issue went to press.

"During mobilization," according to an editorial on the induction boards which appeared in a recent

Journal of the American Medical Association, "the usual flow of men will be from local selective service boards to induction stations for final examination and induction, then to reception centers for classification and other processing, then to organization, installations or replacement centers in which they are to serve.

"The induction station serves the same purpose as the recruiting station does in times of voluntary enlistment. Therefore recruiting stations, augmented as required, will be used as induction stations."

Arrangements for x-ray, laboratory or other special examinations will be made as requested by the chief of the board in local hospitals or clinics.

Well Qualified Men Needed

It is obvious that thoroughly qualified men are needed for this board and that the service may involve a very real sacrifice on the part of members willing to offer themselves.

The importance to the effectiveness of our armed forces and also to the welfare of the individual drafted man, of painstaking examinations at this critical point in the progress from selection to training assignment goes without saying. It is made clearer when experience in the World War is taken into account. From the moment that the drafted man arrives at his training camp he becomes the responsibility of the government and, by the same token, any aggravation of ailments which he is permitted, by oversight, to take with him from civilian life is likely to become the basis for endless claims for compensation in time to come.

PRIVILEGED COMMUNICATIONS

(Monthly editorial prepared by the Medical Advisory Committee.)

Due to recent cases which have been brought to the attention of the Medical Advisory Committee, it is necessary that we again stress the fact that meticulous records, both office and hospital, made at the time of rendering service and signed by the physician or surgeon in charge himself constitutes one of the surest defenses against malpractice litigation; also that additions to these original records, if necessary, should under all circumstances be made, if possible, by the original writer, or at least, read and initialed by him. If not, the name of the writer of such additions should appear in full on the record.

These records should then be carefully preserved and made available at all times to the maker of them, but their contents should be con-

sidered as confidential information and at no time should they be exposed to public perusal unless the law or the courts demand it.

If privileged communications obtained in the physician-patient status are required by insurance companies, governmental agencies or any other party, they should only be divulged when the request is made in writing and such request signed by the patient or his legal representative, the request to be filed with the record together with copy of the report submitted.

Careful attention to this will become more and more necessary as government and state authorities, as well as private institutions, demand a greater quantity of information from the members of our profession.

The giving out of privileged communications and confidential information without proper authorization can become a distressing incident in the life of a physician.

—B.J.B.

THANKS OF THE COUNCIL

Special thanks and appreciation were expressed by the Council at their fall meeting to the following:

To Dr. J. M. Armstrong of Saint Paul, long chairman of the Historical Committee, for his faithful service and distinguished contributions to the collection, editing and publishing of manuscripts of the committee now appearing in MINNESOTA MEDICINE under the title "History of Medicine in Minnesota." Dr. Armstrong recently retired from the active practice of medicine in Saint Paul.

To the Olmsted - Houston - Fillmore - Dodge County Medical Society and to Mr. R. R. Rosell, executive secretary of the Minnesota State Medical Association, and his staff for their successful conduct of the 87th annual meeting of the Association held at the Mayo Civic Auditorium in Rochester last April. The final report of that meeting presented to the Council showed a substantial profit which has been turned over to the general fund of the Association.

PRICE OF HEALTH

The statement that the medical or health bill for society is too large is but an expression of the reluctance of society to pay the price for good health, as well as an evidence of complete failure to place full value on man's greatest asset—good health.

—FRANCIS F. BORZELL, M. D., in
Pittsburgh Medical Bulletin,
October 26, 1940.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary
Saint Paul, Minnesota

Itinerant Health Lecturer Pleads Guilty to Fraudulent Advertising and Practicing Healing Without a Basic Science Certificate

Re: State of Minnesota vs. Edward F. Marcell
Re: State of Minnesota vs. Guy Pearson

On October 5, 1940, Edward F. Marcell, fifty-three years of age, who gave Pasadena, California, as his home, entered a plea of guilty in the District Court of Morrison County, to an information charging him with the crime of practicing healing without a basic science certificate. The Honorable Don M. Cameron of Little Falls, Minnesota, Judge of the District Court, sentenced Marcell to pay a fine of \$400.00 plus costs of \$5.18, or to serve one year in the Morrison County Jail. Marcell paid the fine and costs. Marcell's brother-in-law, Guy Pearson, 31 years of age, of North Power, Oregon, pleaded guilty to assisting Marcell, and was sentenced by Judge Cameron, at the same time, to pay a fine of \$50.00 and costs of \$5.19, or to serve 90 days in the Morrison County Jail. Pearson paid the fine and costs.

Following a disposition of their cases in the District Court, Marcell and Pearson were arraigned before the Honorable Phil S. Randall, Judge of the Municipal Court of Little Falls, on a charge of fraudulent advertising. Both defendants pleaded guilty and each was sentenced by Judge Randall to pay a fine of \$100.00 and costs of \$3.10, or to serve ninety days in the Morrison County Jail. This sentence was suspended by Judge Randall because both defendants had paid their fines in the District Court, and upon the further condition that the defendants refrain from practicing healing in any manner in the State of Minnesota. The defendants are also to refrain from inserting any further advertisements in Minnesota papers, and in addition, they are to leave the State of Minnesota by October 15, 1940.

Marcell and Pearson arrived in the State of Minnesota about September 9, 1940, and proceeded to advertise a so-called exposé of devils, drugs and doctors at Detroit Lakes, Minnesota. They advertised a so-called health lecture for women only, following which a lecture was to be given for men only. The matter was called to the attention of the Minnesota State Board of Medical Examiners, but too late to apprehend the defendants at Detroit Lakes. Subsequently the defendants operated at Bemidji, Virginia and Little Falls, where they were arrested on October 4, 1940, following an investigation made by F. Manley Brist and Reginald M. Johnson on behalf of the Minnesota State Board of Medical Examiners, in cooperation with County Attorney Austin L. Grimes, Sheriff William J. Butcher and Deputy Sheriff Henry A. Smith. This investigation disclosed that the true purpose of inserting the advertisement was to secure prospective purchasers of a so-called health course which Marcell was selling at \$58.00 per patient. Marcell recommended this health course as a treatment for a multitude of human ailments and claimed that it consisted of various mineral preparations in capsule form. As a special inducement, the health course could be purchased for \$36.00 cash while Marcell was in Little Falls. The defendant's manner of operation, including the deceit practiced upon the public in the advertisement, and the numerous false statements made in the advertisement inserted in the Little Falls newspaper, stamp the defendants' activities as quackery. Both defendants readily admitted

Communication

that they had no medical training whatsoever. Marcell stated that he was in the commercial photography business for a number of years, and that in August 1939, his father died at Pasadena, California. He stated that his father had operated this so-called health course for many years.

The Minnesota State Board of Medical Examiners is very much pleased with the disposition made of these cases by Judge Cameron and Judge Randall. It, perhaps, is hardly necessary to point out that the imposition of a few stiff fines, such as were imposed in these cases, will go a long way toward stamping out this type of quackery. Minnesota has been comparatively free of this evil. Nevertheless, one or two other persons have operated in this State, and needless to say that other prosecutions are contemplated. The Minnesota State Board of Medical Examiners wishes to acknowledge the very prompt and efficient coöperation given in these cases by the local authorities, and particularly by County Attorney Grimes, Sheriff Butcher, and Deputy Sheriff Smith, all of Morrison County.

Minneapolis Woman Sentenced to Eight-Year Term at Hard Labor for Criminal Abortion

Re: State of Minnesota vs. Hattie Anderson.

On October 16, 1940, Mrs. Hattie Anderson, forty-five years of age, entered a plea of guilty to an information charging her with the crime of abortion. Due to the fact that the defendant had a previous conviction in 1933, for a similar offense, Mrs. Anderson was sentenced by the Honorable Paul S. Carroll, Judge of the District Court of Hennepin County, to a term of not to exceed eight years at hard labor in the Women's Reformatory at Shakopee.

Mrs. Anderson, who holds no license to practice any form of healing in the State of Minnesota, stated that she lived at Mound, Minnesota. On September 22, 1940, she performed a criminal abortion upon a twenty-one year old Wisconsin girl. The abortion was performed at Apartment 3, 89 Spruce Place, Minneapolis. Mrs. Anderson was paid \$25.00 for her services. The girl became critically ill and was taken to Deaconess Hospital where she died on Tuesday, October 8, 1940. Because of the fact that the case was promptly reported by the attending physicians to the Minnesota State Board of Medical Examiners, it was possible, with the coöperation of the Women's Bureau of the Minneapolis Police Department, to obtain a statement from the girl before she died. The defendant was immediately placed under arrest and taken to the Hospital where she was identified by the girl just a few hours prior to her death.

Mrs. Anderson had a previous conviction for a similar offense on April 11, 1933, on which date she entered a plea of guilty in the District Court of Hennepin County to an information charging her with the crime of abortion. She was sentenced at that time, to a term of not to exceed eighteen months in the Women's Reformatory, but was placed on probation. She violated her probation by performing a subsequent abortion, and on February 21, 1936, her stay of sentence was vacated by Judge Baldwin. Mrs. Anderson served fourteen months and eighteen days for that crime. In the instant case it was decided to charge the defendant with the crime of abortion rather than manslaughter, because of her previous conviction, the laws of the State of Minnesota providing that where a defendant has one previous conviction, the Court may double the sentence for a subsequent offense. Mrs. Anderson attempted to have the Court limit her sentence to four years, but Judge Carroll told her that she had been shown considerable leniency by the State of Minnesota when she was charged with the crime of abortion rather than manslaughter.

MINNESOTA MEDICINE
Saint Paul, Minnesota
Gentlemen:

Men of medical and dental professions should be on guard against an imposter who goes about "borrowing" money. He represents himself variously as a physician, a dentist, or a son of a physician (depending on whom he is striking for a loan), as practicing in various small towns of the state and giving various names (Dr. Claud Mays, Rush City, Minn. when he interviewed me).

His story varies but in the above interview he was on his way home, had his wife and baby with him and would I lend him two dollars (his request is usually from two to five dollars) to get home on and he would send it back to me the next day. He disappeared while I was telephoning to check up on him.

He has a great deal of information about physicians indicating that he may have a medical directory to consult. He rushes in, greets with a glad hand, speaks very rapidly and glibly and has been very successful in victimizing many physicians and dentists in Duluth on at least three occasions in the past two years. A man answering his description has also operated on the Iron Range as well as in Superior, Wis. A man also answering his description has gone from house to house in Duluth selling "reducing pills" "recommended by the doctors at Rochester, Minnesota." He asks \$1.50 down and the pills to be delivered in a week at which time the customer was to pay another \$1.50 for the bottle.

This man is short, perhaps 5 feet 4 to 6 inches. He is very stocky and heavily built, has dark hair, and a very round face with plump cheeks. My impression is that he had a scar on the right side of the forehead. He was dressed in a wrinkled faded blue or blue-green suit.

By being forewarned, quick action on the part of the intended victim and coöperation with local authorities may result in the arrest and conviction of this imposter.

Yours truly,
L. L. MERRIMAN, M.D.
923 Medical Arts Bldg.
Duluth, Minnesota
October 3, 1940.

THE GANG THAT RUNS THINGS

"Ah, what's the use?" said the enthusiastic young physician, "I tried to horn in here, but only busted my horn! There is a gang that runs this medical society, and outsiders have no more show than a snake has hips!"

The Past President, to whom this remark was directed, lighted an obese cigar with a red and gold life preserver around its midriff and then spoke:

"You are right, young man, and you are wrong," he said. "By this statement I mean that you are right about a 'gang' running the society. There's a 'gang' running every organization on earth. If there wasn't there wouldn't be any organization. On the other hand, you are wrong when you say you tried to horn in and couldn't. You did not go about it right. Any good guy who wants to horn into any gang has to know the password, and I will give it to you in strictest confidence. Those words are: 'What can I do to help?' Any man who will use those words will find himself as busy as a one-armed piano player with a bad case of hives!"

—Detroit Medical News.

OF GENERAL INTEREST

At Ruthton, Minnesota, Dr. Arthur F. Sether is a member of the village council.

* * *

Dr. W. R. Morrison of Billings, Montana, recently visited in Bemidji, Minnesota, where he practiced for eight years, from 1900 to 1908, before going to Billings.

* * *

Dr. Paul F. Dwan of Minneapolis, who is recuperating after a severe illness, will leave about December 1 with his family for Florida to spend the winter.

* * *

Dr. Myron O. Henry of Minneapolis was guest speaker at the Camp Release Medical Society meeting at Dawson, Minnesota, October 11. His subject was "Treatment of Fractures of the Upper Extremity."

* * *

Dr. H. S. Diehl and Dr. C. D. Creevy of the Medical School, represented the University of Minnesota at the meeting of the Association of American Medical Colleges at Ann Arbor, Michigan, October 28-30.

* * *

Dr. Seigfried C. G. Oeljen of Waseca has moved into his newly completed office building north of the court house. The building, which houses only his offices, is of brick and is 22x47 feet.

* * *

Dr. F. G. Gunlaugson, health officer of the Mankato district office of the Minnesota Department of Health and a first lieutenant in the medical reserve officers corps, has been called to active duty for the next year. He is stationed at Fort Snelling.

* * *

Dr. George Michael Jennings, chief surgeon at the Northern Pacific Beneficial Association Hospital in Missotla, Montana, and a graduate of the University of Minnesota Medical School '08, passed away October 16.

* * *

Dr. A. E. Hansen, assistant professor of pediatrics at the University of Minnesota Medical School, addressed the annual meeting of the Bryan Memorial Hospital in Lincoln, Nebraska, October 8, on the subject of "Rheumatic Fever."

* * *

The marriage of Dr. J. J. Stratte of Grand Forks, North Dakota, to Miss Irene Dille, took place September 30. Dr. Stratte, former Kittson County surgeon, in addition to his practice in Grand Forks, is associated with the Berlin-Griffin Clinic at Hallock, Minnesota.

Dr. George C. Kimmel, Mayo Foundation fellow, will become associated with the Interstate Clinic at Red Wing, January 1, it is announced. Graduated from the University of Minnesota Medical School in 1936, Dr. Kimmel took his internship at Temple University in Philadelphia.

* * *

Dr. Bernard Watson, who left the staff of the University of Minnesota Health Service and Medical School last spring to become associated with the Battle Creek Sanitarium at Battle Creek, Michigan, visited in Minneapolis in October, while in the state on a pheasant hunting trip.

* * *

Dr. and Mrs. George B. Weiser of New Ulm marked their fiftieth wedding anniversary, October 2. They were married in 1890 at Selinsgrove, Pennsylvania. Their son-in-law and daughter, Mr. and Mrs. C. T. Ekelund of Pontiac, Michigan, came to New Ulm for the celebration, at which the couple received the congratulations of their many friends.

* * *

Dr. Russell W. Morse of Minneapolis was installed as president of the Hennepin County Medical Society, October 8. He succeeds Dr. James A. Johnson. Plans for the year include sponsorship of a series of lectures for expectant mothers in connection with the adult education program of the YWCA. Lectures will be given each Friday morning.

* * *

Dr. A. C. Ivy of Chicago will give the annual E. Starr Judd lecture at the University of Minnesota Medical Amphitheatre, January 15, 1941, at 8:15 p. m. His subject is "The Mechanisms of Gastric Secretion."

Dr. Ivy is head of the Department of Physiology and Pharmacology at Northwestern University Medical School.

* * *

Dr. Hans E. Guloien of Fargo, North Dakota, has located in Willmar, Minnesota, opening offices there at 316 West Fifth Street.

A graduate of Rush Medical School, University of Chicago, in the Class of 1938, Dr. Guloien served his internship at St. Mary's Hospital in Duluth. Prior to coming to Willmar, he was resident surgeon at the Mary McClellan Hospital at Cambridge, New York.

* * *

A father and his son have become associated in the practice of medicine in Red Wing, Minnesota. Dr. L. E. Claydon, one of the oldest practicing physicians in

Goodhue county, and Dr. Donald R. Claydon have opened new offices at 324 Main Street. Also associated with them is Dr. E. M. Baldigo, a graduate of the University of Minnesota Medical School, who served his internship at Miller hospital in Saint Paul.

* * *

Dr. and Mrs. William M. Balfour of Rochester, New York, are the parents of a son, James McQuarrie Balfour, born August 26. Dr. Balfour, who is a research fellow in pathology at the University of Rochester Medical School, is the son of Dr. and Mrs. Donald C. Balfour of Rochester. Mrs. Balfour, the former Oane McQuarrie, is the daughter of Dr. and Mrs. Irvine McQuarrie of Minneapolis.

* * *

Dr. R. F. Pierson, licensed in Minnesota by reciprocity with Nebraska, has become associated with Dr. Henry C. Doms of Slayton, Minnesota. Dr. Pierson, who was graduated from the University of Nebraska in June, 1938, served one year as an intern at the Clarkson Hospital in Omaha, and six months at the Fairview Hospital in Minneapolis.

Dr. Pierson married Miss Maxine Steggs, a graduate of the Clarkson Hospital School of Nursing, April 7, 1940.

* * *

The University of Minnesota Medical School has instituted a required course in First-Aid for freshmen medical students. The one-quarter course, consisting of fourteen lectures and six practical demonstrations, was instituted because it was felt that it was pertinent to the preparedness program in event of an emergency. The University of Minnesota is one of the first medical schools in the country to include such a course for freshmen in the curriculum. Ordinarily, medical students do not receive any instructions in caring for emergencies until they are juniors and seniors.

* * *

Dr. Bertram S. Adams, president of the Minnesota State Medical Association, was honored by the Hibbing Elks Lodge and citizens of Hibbing for his civic service to the community and the state, October 22. The testimonial dinner, an outstanding event in north-eastern Minnesota, was the Elks' seventh annual honor night.

More than 400 men, many of them distinguished leaders of the medical and dental professions and of fraternal societies, attended the dinner. In addition to verbal tributes, there were scores of congratulatory telegrams and communications, among them one from Governor Harold E. Stassen and another from the employees of the Adams Hospital.

* * *

Dr. A. B. Stewart of Owatonna, "dean" of the medical and surgical profession of Steele County, was the

recipient of many congratulatory messages when he observed his seventy-seventh birth anniversary, September 23.

Born at Hume, New York, in 1863, Dr. Stewart has practiced in Owatonna since June, 1891. He has studied at hospitals and clinics in Vienna, and Edinburgh, and holds a fellowship in the American College of Surgeons. In 1918 he was given the rank of major in the U. S. Army and was chief of the medical staff at Fort Snelling.

* * *

Dr. B. T. Horton of Rochester addressed a meeting of the Tennessee Valley Postgraduate Medical Assembly in Knoxville, Tennessee, October 10. He presented two papers: "The Treatment of Peripheral Vascular Disease" and "Histamine in the Treatment of Specific Types of Headache." On October 14, he addressed a meeting of the Norfolk County Medical Society in Norfolk, Virginia, speaking on "The Treatment of Headaches and Vertigo with Histamine." From there he went to the University of Virginia in Charlottesville to speak before a meeting of the Virginia Neuropsychiatric Society.

* * *

When the fifteenth annual conference of the Association of Clinic Managers is conducted in Rochester, November 6, 7 and 8, the program will include an address of welcome by Dr. C. W. Mayo; an address, "The Value of Medical Statistical Research" by Dr. Joseph Berkson of Rochester; a talk on "Medico-military Preparedness" by Dr. Russell M. Wilder of Rochester, chairman of the Committee on Medicine in the Division of Medical Sciences of the National Research Council; and an address, "Air Conditioning: Its Use and Limitations in Clinics and Hospitals" by Dr. Charles Sheard of Rochester.

* * *

Three experiments, designed to engender and conserve energies and resourcefulness of the United States Army, are being carried on in the University of Minnesota physiological laboratories under the direction of Dr. Ancel Keys, professor of physiology. One of the projects has to do with the study of fatigue in soldiers in marching and field operations, and with means of reducing the fatigue and increasing ability to carry on maneuvers.

A second experiment concerns the prevention and treatment of wound shock, especially in emergencies arising on the battlefield; the third, with a study of heart and circulation under conditions of low oxygen supply, as found in planes flying at high altitudes.

* * *

Two Minnesota physicians were among the prize winners in the Abbott Camera Competition for Physicians, and two others received honorable mention.

Dr. Lawrence Berman of Saint Paul was one of the

fourth prize winners in the pictorial and general division with his entry, "Hilltop." Dr. Charles Heilman of Rochester and Dr. Ernest J. Losli of Minneapolis were among those who received honorable mention. Dr. A. J. Hertzog of Eau Claire, formerly of the University of Minnesota Medical School staff, won an honorable mention.

Dr. J. R. Sturre of Minneapolis won third prize in the division devoted to Gross Specimens and Photomicrographs.

* * *

Dr. Irvine McQuarrie, head of the Department of Pediatrics at the University of Minnesota Medical School, has returned from Rochester, New York, where he addressed two meetings. He spoke at the Rochester Academy of Medicine, October 15, his subject being "Medical Conditions in North China As Related to Military Invasion." On October 16 he addressed the Rochester Pediatrics Society on "Adrenal Tumors in Childhood."

Dr. McQuarrie on September 18 and 19 gave two lectures at the University of Iowa in Iowa City for a program on Maternal and Child Hygiene, sponsored by the State Board of Health. His subjects were "Anoxia and Asphyxia in the New Born" and "Common Diseases of the New Born Infant."

* * *

Physicians who are lecturing in the course, "Orientation to Practice," offered to seniors in the University of Minnesota Medical School, include: Dr. H. S. Diehl, "Opportunities In and Preparation for Practice"; Dr. A. W. Adson of Rochester, "Medical Licensure"; Dr. W. A. O'Brien, "Quackery, Fads, Cults and Patent Medicines"; Dr. F. J. Hirschboeck of Duluth, "The Ethics of the Practice of Medicine"; Dr. S. M. White, "The Management of the Public and Private Patient"; Dr. J. M. Hayes of Minneapolis, "Starting the Practice of Medicine"; Dr. B. J. Branton of Willmar, "Malpractice"; Dr. R. E. Scammon, "Medical Care of the Indigent and of Low Income Groups." Judge Paul Carroll of Minneapolis is lecturing on "The Physician in Court."

* * *

Representing the University of Minnesota at the American Public Health Association meeting in Detroit, Michigan, in October were: Dr. Ruth E. Boynton, director of the Students' Health Service; Dr. Ralph V. Ellis, associate professor of preventive medicine; Dr. Gaylord Anderson, head of the Department of Preventive Medicine and Public Health; Miss Mellicie Palmer, acting director of the course in Public Health Nursing; George O. Pier, assistant professor; and Miss Mary Parker.

Though he was unable to attend, Dr. W. A. O'Brien was honored at the banquet, October 10. He was among the former members of the Detroit Department of Health, who were awarded certificates of merit for the outstanding work they have done elsewhere. The awards were made by Dr. Henry F. Vaughn, director of the Department of Health of the city of Detroit.

The first annual Minnesota Medical Foundation Lecture will be presented at the University of Minnesota Medical School on Tuesday evening, November 12. Dr. Conrad A. Elvehjem, Professor and Head of the Department of Biochemistry, University of Wisconsin, will present the lecture, the title of which is "The Biochemistry of the Vitamin B Complex."

* * *

The University of Minnesota Board of Regents has accepted a gift of a collection of medical journals from Dr. Ivar Siversten of Minneapolis.

* * *

Dr. Morris Fishbein was principal speaker at the General Medical Faculty annual dinner meeting in the new Coffman Memorial Union on the University of Minnesota campus, October 4. He spoke on "Medical Writing" and "The Role of the Medical Profession in National Defense."

Dr. H. S. Diehl presided at the dinner, the program for which also included talks by Dr. James S. McCartney on the admission of students to the Medical School during the current year; a report by Dr. Erling S. Platou, president, on the development of the Minnesota Medical Foundation during its first year; a report by Dr. W. A. O'Brien on postgraduate medical courses during the past year; observations by Dr. Irvine McQuarrie on his recent visit in China, when he held a visiting professorship at the Peiping Union Medical College. Dr. Diehl reported on the organization of the United States General Hospital Unit No. 26.

* * *

The 1941 convention of the Interstate Post Graduate Medical Association of North America to be held in Minneapolis next October, is expected to bring 4,000 physicians and surgeons to that city.

The association recently concluded its 1940 assembly in Cleveland, Ohio. Speakers at the meeting, held from October 14 through 18, included several Minnesotans: Dr. Maurice B. Visscher, head of the physiology department at the University of Minnesota, whose subject was "Intestinal Absorption as a Clinical Physiological Problem"; Dr. Walter C. Alvarez of Rochester, who conducted a diagnostic clinic, "Puzzling Cases of Abdominal Pain"; Dr. Waltman Walters of Rochester, diagnostic clinic, "Surgery of the Pancreas"; Dr. Howard K. Gray of Rochester, address, "Cancer of the Stomach"; Dr. Charles W. Mayo of Rochester, address, "The Treatment of Vesico-Colonic Fistula"; Dr. Claude F. Dixon of Rochester, diagnostic clinic, "Diverticulitis"; Dr. Alfred W. Adson of Rochester, diagnostic clinic, "Surgical Treatment of Peripheral Vascular Disease"; Dr. William F. Braasch of Rochester, address, "Infections of the Urinary Tract"; Dr. John S. Lundy of Rochester, address, "Choice of Anesthesia."

Dr. William L. Benedict of Rochester gave the Schneider Foundation Eye Presentation. The subject of his address was "Relationship of Ophthalmology to Systemic Disease."

The first permanent board of trustees for the Minnesota Medical Foundation was elected at the organization's first annual meeting, October 25, in the new Coffman Memorial Union on the University campus.

Elected to the board of twelve members to serve terms of four years each were Dr. William W. Will of Bertha, Dr. Edwin J. Simons of Swanville, Dr. Lloyd H. Rutledge of Detroit Lakes; to serve three-year terms, Dr. Russell J. Moe of Duluth, Dr. Albert M. Snell of Rochester and Dr. Gordon C. MacRae of Duluth; two-year terms, Dr. Jennings C. Litzenberg, Dr. Owen H. Wangenstein and Dr. Cecil J. Watson of Minneapolis; and one-year terms, Dr. Erling S. Platou of Minneapolis, Dr. George A. Earl of St. Paul and Dr. Robert L. Wilder of Minneapolis.

Dr. Platou, president of the Foundation, presided at the meeting and reported on the program and development of the Foundation during the past year. Dr. Wilder gave the secretary's report, and Dr. Litzenberger, the treasurer's report. Reporting on membership expansion activities were Dr. Will, Dr. Moe and Dr. Olga Hansen. Dr. Maurice B. Visscher, editor of *The Bulletin of the Minnesota Medical Foundation*, reported on that publication.

Dr. Erling W. Hansen reported for the Nominating Committee.

* * *

Speakers at the twelfth annual meeting of the Medico-Military Inactive Status Training Unit in Rochester October 6-20, included besides members of the Mayo Clinic staff: Colonel Kent Nelson, MC USA, Medical Director R.O.T.C. University of Minnesota; Major F. B. Waweman, MC USA, Washington, D. C.; Lt. Comdr. Donald McCarthy, MC-O, USNR, Minneapolis; Lt. Albert R. Behnke, Jr., MC USN, Washington; Captain Andrew H. Davidson, MC USN, District Medical Officers 9th Naval District, Great Lakes, Illinois.

Also Lt. Col. Jarret M. Huddleston, MC USA, Fort Snelling, Minnesota; Colonel Monte Belot, Med. Res., Kansas City, Missouri; Comdr. John R. Poppen, MC USN, Bureau of Aeronautics, Navy Department, Washington, D. C.; D. R. Brimhall, Director of Research, C.A.A., Washington; Dr. H. S. Diehl of the University of Minnesota; Brig. Gen. John H. Hester, Inf. Executive for Reserve Affairs, War Department, Washington.

Also Colonel A. D. Tuttle of United Airways, Chicago; Lt. Herbert M. Bosch of the Minnesota State Board of Health, Minneapolis; Major James J. Morrow, Med. Res. of Austin; Lt. Comdr. R. H. Hunt, MC USN, Minneapolis; and Dr. Edward A. Dosey, Professor of Bio-Chemistry and Director of the Department, St. Louis University Medical School, St. Louis, Missouri.

The staff consisted of Dr. Donald C. Balfour, director of the Mayo Foundation; Col. Herbert C. Gibner, MC USA, Corps Surgeon, 7th Corps Area, Omaha; Captain Ernest W. Brown, MC USN, Senior Medical Officer, Navy Yard, New York; Col. Frederick L. Smith, Med. Res. USA, Rochester; and Captain Robert O. Pearman, Med. Res., St. Joseph, Missouri.

In Memoriam

John Rishmiller

Dr. John Rishmiller, Minneapolis surgeon for many years, passed away at the home of a nephew in Gibbon, October 15. He was seventy-four years old.

Dr. Rishmiller was chief surgeon of the Soo Line Railway in Minneapolis for a long period, but severed his connection several years ago when he retired from practice. He had made his home in Gibbon since last spring.

Dr. Rishmiller was vice president of the Hennepin County Medical Society in 1912.

Charles Alex Van Slyke

Dr. Charles Alex Van Slyke, one of the first ophthalmologists to practice in Saint Paul, died Sunday, July 21, 1940.

Dr. Van Slyke's father, William A. Van Slyke, came to Minnesota Territory in 1859, was active in politics, and is said to have been the father of the park system in Saint Paul.

Charles A. Van Slyke was born December 14, 1865. He received his education at the Franklin School and later attended Shattuck Military Academy at Faribault where he was a member of the football and baseball teams. In 1887 and 1888 he attended medical lectures at the Saint Paul Medical College and in 1889 at Cooper Medical College, San Francisco.

In the winter of 1890, Dr. Van Slyke made a trip to the South Sea Islands. He wrote a short description of the trip and made an interesting collection of shells from the islands.

Dr. Van Slyke received his medical diploma from the Medical School of the University of Minnesota in 1891. He spent part of the year 1892 in study abroad. Upon his return he studied during the years 1893 to 1895 at the New York Ophthalmic and Aural Institute. He was house officer at Knapp Hospital for Eye, Ear, Nose and Throat in 1894. He then returned to Saint Paul and began the practice of his specialty with his brother, Dr. Fred Van Slyke. He had offices in the Kendrick Building, Baltimore Block, Endicott Building and the Lowry Medical Arts Building. He was in active practice until 1936 when he sustained a cerebral accident. He later established an office at his residence. A second cerebral accident in 1940, followed by a hip fracture from a fall, proved fatal.

Dr. Van Slyke belonged to the Saint Paul Rod and Gun Club for many years and was president of that club in 1911. He was a member of the Royal Arch Masons for many years and was a thirty-second degree Mason and a Knight Templar. He was president of the Junior Pioneers in 1919. In early life he was a member of the Minnesota National Guard.

Dr. Van Slyke was a member of the Minnesota Academy of Ophthalmology, the Ramsey County Medical Society, the Minnesota State and American Medical Associations.

Dr. Van Slyke married Anna C. Perrior in Saint Paul, December 15, 1902. He is survived by his widow, a son, Charles Alex Van Slyke, Jr., of Milwaukee and a daughter Mrs. Ralph Coggeshall of Plainfield, New Jersey, a brother, Kenneth, of Saint Paul and a sister, Grace, of Saint James, Minnesota.

He had many loyal patients and friends.

—JAMES C. FERGUSON.

J. Thornwell Witherspoon

Dr. J. Thornwell Witherspoon, a member of the Hennepin County Medical Society and editor of *Modern Medicine*, passed away recently at the Norwalk Hospital in Norwalk, Connecticut.

He was a contributor to medical literature, having published more than fifty articles and many abstracts in leading gynecological and surgical journals. His latest medical textbook, "Clinical Pathological Gynecology," was published in 1939.

Born in New Orleans in 1900, he was graduated from Princeton University and spent two years at Oxford on a Rhodes scholarship. He received his M.D. degree at Johns Hopkins University.

Victor A. Young

Dr. Victor A. Young passed away August 20, 1940 at his home in West Duluth, Minnesota, after an illness of three years.

He was a native Minnesotan, born at Amor, Minnesota, April 21, 1875. In 1903 he received his M.D. degree at Hamline University. The year before his graduation he was married to Mary Alice Jones, a daughter of a pioneer physician, at Battle Lake, Minnesota. This companionship was interrupted by the death of Mrs. Young in February, 1930. The responsibility of two daughters and two sons fell on Dr. Young's shoulders. In August, 1935, he married Susan A. Isaacson of Fergus Falls, Minnesota, who together with his children survive him.

Dr. Young's first practice was at Scanlon, Minnesota, which, at that time, was a lively lumbering town. Here he remained for two years and then moved to Hankinson, North Dakota. In 1915 he located in West Duluth, Minnesota, and continued his practice there until his death.

Dr. Young will be remembered for his devotion to his work and his kind sympathy and understanding.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR NOVEMBER

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

November 2—Eye Injuries

November 9—Glaucoma

November 16—The Cross-eyed Child

November 23—Cataracts

November 30—Children's Dentistry

UNIVERSITY OF CHICAGO POSTGRADUATE COURSES

The Department of Obstetrics and Gynecology of the University of Chicago and the Chicago Lying-in Hospital, through the coöperation of the Children's Bureau, U. S. Department of Labor and the Illinois State Department of Public Health, offers five postgraduate courses of four weeks each between January 6 and June 21. The beginning dates of each are: January 6, February 10, March 17, April 21, and May 26. All the members of the department and all services and units of the institution participate in the instruction. Only a limited number of postgraduate students are accepted for each period. A deposit of \$25.00 is required, of which \$10.00 is returned on completion of the course. All communications should be addressed to: Postgraduate Course, 5848 Drexel Avenue, Chicago, Illinois.

AMERICAN PUBLIC HEALTH ASSOCIATION

The registered attendance of the 69th Annual Meeting of the American Public Health Association and meetings of related organizations held in Detroit the week of October 7 was 3,187, second largest in the Association's history. Delegates came from every State in the Union, the District of Columbia, Alaska, Hawaii, Puerto Rico, Canada, Cuba, Mexico, Denmark, China and New Zealand.

The officers elected for the year 1940-1941 are as follows:

President: W. S. Leathers, M.D., Nashville, Tenn.

President-elect: John L. Rice, M.D., New York, N.Y.

Vice President: Robert D. Defries, M.D., Toronto, Can.

Vice President: Charles Edward Finlay, M.D., Havana, Cuba.

Vice President: Selskar Gunn, New York, N. Y.

Treasurer: Louis I. Dublin, Ph.D., New York, N. Y.

Chairman of Executive Board: Abel Wolman, Dr. Eng., Baltimore, Md.

Executive Secretary: Reginald M. Atwater, M.D., New York, N. Y.

A Committee on Public Health in the National Defense was appointed with the following personnel: W. S. Leathers, M.D., Chairman; Stanley H. Osborn, M.D.; Huntington Williams, M.D.; Abel Wolman, Dr. Eng.

Among the resolutions passed was one emphasizing the necessity for maintaining civilian health as essential in national defense and pledging the united support of members to the national defense and to the maintenance of health in a free people.

The 70th Annual Meeting will be held in Atlantic City, N. J., in October, 1941.

ALUMNI ASSOCIATION OF THE MAYO FOUNDATION

Dr. Porter P. Vinson of Richmond, Virginia, was elected president of the Alumni Association of the Mayo Foundation at its twenty-second annual meeting in Rochester last month.

Other officers are Dr. William H. Long of Fargo, North Dakota, first vice president; Dr. J. Blackford of Seattle, Washington, second vice president; Dr. Ernest L. Meland of Minneapolis, secretary. Dr. D. M. Masson of Rochester was re-elected associate secretary and treasurer. Dr. John M. Berkman of Rochester was elected to the board of governors.

Named to the advisory board for three-year terms were Dr. J. M. Culligan of St. Paul, Dr. George D. Mahon of Dallas, Texas, Dr. Robert W. McQuay of Toronto, Dr. Charles H. Leech of Lima, Ohio, and Dr. Lindon Seed of Chicago.

MINNESOTA PATHOLOGICAL SOCIETY

Two papers will be presented at the meeting of the Minnesota Pathological Society, November 19, at 8 p. m. in the amphitheater of the Institute of Anatomy at the University of Minnesota. Dr. R. G. Green will present a paper, "The Nature of Virus Infections," and Dr. John M. Adams, "Epidemic Virus Pneumonia in New-Born Infants."

WABASHA COUNTY MEDICAL SOCIETY

Dr. D. G. Mahle of Plainview was elected president of the Wabasha County Medical Society, succeeding Dr. E. W. Ellis of Elgin, at the society's annual meeting in Plainview, October 10.

Dr. Robert A. Glabe of Plainview was elected vice president, and Dr. W. F. Wilson of Lake City was re-elected secretary-treasurer. Dr. E. C. Bayley of Lake City was named a delegate to the State Association, and Dr. Ellis of Elgin was named alternate. The board of censors is composed of Dr. R. R. Hendrickson of Wabasha, chairman; Dr. Mahle, and Dr. W. J. Cochrane of Lake City.

The business session preceded a duck dinner, at which there were thirty-three guests. Following the dinner, there was a scientific session.

WEST CENTRAL MEDICAL SOCIETY

At the annual meeting of the West Central Medical Society held in Morris, October 9, Dr. F. W. Behmler of Morris was elected president, and Dr. Otto Bergan of Clinton, vice president. Dr. H. Linde of Cyrus was re-elected secretary-treasurer. Named as delegate to the State Association was Dr. C. I. Oliver of Graceville. Alternate is Dr. Charles Bolsta of Ortonville. Dr. N. F. Doleman of Tintah was elected censor for three years.

Dr. E. M. Elsey of Glenwood is the retiring president.

At the meeting a medical fee schedule was adopted by the society.

Dr. B. W. Jarvis of Lowry was accepted as a member of the society.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*

MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

The first fall board meeting of the Women's Auxiliary of the Minnesota State Medical Association was held Friday morning, October 4, in the Center for Continuation Study at the University of Minnesota. Mrs. M. A. Nicholson, state president, presided. Following the business meeting, luncheon was served. Mrs. Wm. B. Roberts of Minneapolis was the social chairman for the day.

It was gratifying to have a splendid attendance. Considerable enthusiasm was shown and an eagerness for the new season's work. Members of the board were guests of the Hennepin County Auxiliary at the open meeting and tea held at the home of Mrs. J. F. Curtin on West Lake Boulevard, following the board meeting.

On Monday, September 30, Mrs. J. J. Ryan of Saint Paul was hostess at an informal breakfast in honor of the national president, Mrs. V. E. Holcombe, who was passing through Saint Paul.

Sincerest sympathy is extended to Dr. Richard R. Cranmer of Minneapolis in the recent death of Mrs. Cranmer who had endeared herself to members of the Auxiliary. Her untimely death, occurring after several weeks of illness, has been a blow not only to her own Hennepin Auxiliary, but to the state board as well. She was a most enthusiastic Auxiliary worker and was also active in the P.E.O. and other organizations.

Mower County Auxiliary recently held its first meeting which was followed by luncheon with twelve members present.

Washington County Auxiliary reports the election of new officers as follows: Mrs. F. M. McCarten, president; Mrs. Gertrude Stevens of Lake Elmo, vice president, and Mrs. C. H. Sherman of Bayport, secretary and treasurer. There were eleven members present at the meeting which was held at the home of Mrs. Landeen.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

OBSTETRICS IN GENERAL PRACTICE. J. P. Greenhill, B.S., M.D., F.A.C.S. Professor of Obstetrics and Gynecology, Loyola University Medical School, Chicago; Professor of Gynecology, Cook County Graduate School of Medicine; Attending Gynecologist, Cook County Hospital; co-editor Year Book of Obstetrics and Gynecology; author of Office Gynecology. 448 pages. Illus. Price, \$3.50, cloth. Chicago: Year Book Publishers, 1940.

VITAMIN THERAPY IN GENERAL PRACTICE. Edgar S. Gordon, M.D., M.A. Associate in Medicine and Instructor in Physiological Chemistry, University of Wisconsin; and Elmer L. Sevringhaus, M.D., F. A. C.P. Professor of Medicine, University of Wisconsin, editor Department of Endocrinology, Year Book of Neurology, Psychiatry and Endocrinology. 258 pages. Illus. Price, \$2.75, cloth. Chicago: Year Book Publishers, 1940.

THE 1940 YEAR BOOK OF PUBLIC HEALTH. Edited by J. C. Geiger, M.D., Dr.P.H. Director of Public Health, City and County of San Francisco; Clinical Professor of Epidemiology, University of California. 560 pages. Illus. Price, \$3.00, cloth. Chicago: Year Book Publishers, 1940.

METHODS FOR DIAGNOSTIC BACTERIOLOGY. A Complete Guide for the Isolation and Identification of Pathogenic Bacteria for Medical Bacteriology Laboratories. Isabelle G. Schaub, A.B., Assistant in Bacteriology, Department of Pathology and Bacteriology, Johns Hopkins University School of Medicine; and M. Kathleen Foley, A.B., Bacteriologist in Charge of the Diagnostic Bacteriological Laboratory of the Medical Clinic, the Johns Hopkins Hospital, Baltimore. 313 pages. Priced, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1940.

THE PRACTICE OF MEDICINE. Third Edition. Jonathan Campbell Meakins, M.D., LL.D. Professor of Medicine and Director Department of Medicine, McGill University; Physician-in-Chief, Royal Victoria Hospital, Montreal; Formerly Professor of Therapeutics and Clinical Medicine, University of Edinburgh, etc. 1,430 pages. Illus. Price, \$10.00, cloth. St. Louis: C. V. Mosby Co., 1940.

BACILLARY AND RICKETTSIAL INFECTIONS—Acute and Chronic. William H. Holmes. Professor of Medicine, Northwestern University Medical School; Chairman Department of Medicine, Passavant Memorial Hospital, Chicago. 676 pages. Price, \$6.00, cloth. New York: The MacMillan Co., 1940.

SYNOPSIS OF MATERIA MEDICA, TOXICOLOGY AND PHARMACOLOGY. For Students and Practitioners of Medicine. Forrest Ramon Davison, B.A., M.Sc., Ph.D., M.B. Assistant Professor of Pharmacology in the School of Medicine, University of Arkansas. 633 pages. Illus. Price, \$5.00, flexible binding. St. Louis: C. V. Mosby Co., 1940.

A TREATISE ON MEDICOLEGAL OPHTHALMOLOGY. By Albert C. Snell, M.D. Lecturer in Ophthalmology, School of Medicine and Dentistry, University of Rochester; Consultant in Ophthalmology, Strong Memorial Hospital and Rochester General Hospital; Ophthalmologist Park Avenue Hospital, Rochester, N. Y., etc. 312 pages. Illus. Price, cloth, \$6.00. St. Louis: C. V. Mosby Co., 1940.

A TEXTBOOK OF MEDICINE BY AMERICAN AUTHORS. Edited by Russell L. Cecil, Professor of Clinical Medicine, Cornell University Medical College. Associate Editor for Diseases of the Nervous System, Foster Kennedy, Professor of Clinical Neurology, Cornell University Medical College. 5th Edition. Philadelphia and London: W. B. Saunders Co. 1940. Price \$9.50.

Previous editions of the textbook have rightly earned great popularity, especially among younger members of the profession. The fifth edition, which has just appeared, contains a number of new articles on subjects not covered in previous editions and a number of rewritten articles on subjects previously covered. Other articles have been brought up-to-date and new illustrations have been added.

On the proper assumption that no one individual can know or present in a textbook all that is known in the field of medicine, the editor has obtained the services of some 130 teachers of medicine in university medical colleges who have written on various subjects of particular interest to them, and the result is a particularly fine volume for the undergraduate medical student or the medical practitioner. This method of textbook writing obviously adds to the up-to-dateness of a volume and that applies to the present volume. The editors are to be congratulated.

C. B. D.

CLINICAL HEART DISEASE. Samuel A. Levine, M.D., F.A.C.P., Assistant Professor of Medicine, Harvard Medical School. Second Edition. 495 pages. Illus. Price \$6.00. W. B. Saunders Company, 1940.

Levine's second edition of his "Clinical Heart Disease" is a book written by a clinician for clinicians. It is a clear, concise monograph on modern cardiology. This is no treatise on cardiac physiology, nor does it contain unnecessary pages of references. It is a book which reflects years of experience in cardiology, and it gives to the reader the practical results of the author's knowledge. The book is well written and easy to read. Levine's monograph is highly recommended both for students and practicing physicians.

M. J. SHAPIRO, M.D.

SYMPTOMS OF VISCERAL DISEASE. F. M. Pottenger, A.M., M.D., LL.D., F.A.C.P. 5th edition. 442 pages. Illus. Price \$5.00. St. Louis: C. V. Mosby Co., 1938.

The author is one of the real pioneers in a fundamental and consistently neglected field. In some teaching institutions his approach to the character of disease is almost heresy. His broad view axiomatically precedes the opening chapter in these words: "There is a patient who has the disease as well as the disease which has the patient."

Dr. Pottenger is a chronic abstainer from the evils of dogma and the empiric modus operandi. He is a sincere champion of the constructive evolution of medical practice. This is evidenced by one sentence in his

introduction to this edition: "Nearly every chapter has been partially or wholly rewritten." Those of us, whose privilege it is to know him, understand this to convey his consistent dissatisfaction with our limitations. He remains dissatisfied with such routine practice as considering a case complete by virtue of an accepted diagnostic name and, arbitrarily given, more or less effective accepted therapy. He cares more for the physiologic bedrock than the nominally polished but meaningless superstructure.

For simple illustration, some are appeased by such a term as "nervous stomach." He would like to know where the nervousness originates and how it operates. Is it central, sympathetic, parasympathetic, endocrine, humeral, or what, and if so, why?

Through all the areas and systems of the body this insatiable curiosity stalks. His answers are by no means complete or wholly adequate (nor are anyone's), but his search could be a source of stimulation to anyone with a will or a desire to pursue truth or allow a well deserved vacation to his suppressed analytic intellect.

ROBERT LYMAN NELSON, M.D.

OPERATIVE SURGERY. J. Shelton Horsley, M.D., LL.D., F.A.C.S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va., and Isaac A. Bigger, M.D., Professor of Surgery, Medical College of Virginia, Surgeon-in-chief, Medical College of Virginia Hospitals, Richmond, Va. Fifth Edition. 2 Volumes. 1,567 pages. Illustrated by Helen Lorraine. Price \$18.00. St. Louis: C. V. Mosby Company, 1940.

A two-volume work which covers the operative procedures of the authors and collaborators is not an attempt to include all surgical operations, but is rather to a considerable extent a record of the author's personal experiences.

Among the new procedures described are ligation of the patent ductus arteriosus, segmental pneumonectomy, and extrapleural pneumothorax. Segmental pneumonectomy is a recent development in the surgical treatment of bronchiectasis and extrapleural pneumothorax appears to have a distinct place in the surgical treatment of pulmonary tuberculosis. The chapter on peritonitis in which the pathology, symptoms and treatment of the various types of peritonitis are considered is of great interest.

Blood banking, the use of Mueller's solution and Elman and Weiner's method of giving amino acids for protein replacement are described. Clute's incision is given for exposing the diaphragm, the terminal esophagus, and the cardiac end of the stomach. A new tube gastrostomy is described which may be used as a substitute for the intranasal Jutte or Levine tube.

The treatment of appendicitis is considered in great detail, and the most recent statistics are given.

Operations for lesions of the intravertebral discs and hypertrophy of the ligamentum flavum are described and illustrated, as also is the treatment for bronchial asthma by division of the sympathetic and parasympathetic nerves in the root of the lung.

The section of plastic surgery is especially well il-

lustrated. Operations for webbed fingers, the repair of harelip and cleft palate deformities, descriptions of pharyngoplasty, operation for ptosis of the eyelids, operations for rhinophyma, and the tubed pedicle flaps are described and illustrated.

In the section on orthopedics the new technic for nailing intracapsular fractures of the hip, a bone peg for ununited fractures of the carpal scaphoid, Schanz's osteotomy, McMurray's osteotomy, Stein's operation for hallux valgus, a new operation for hammer toe, operations to equalize the length of the lower extremities, Ober's fasciotomy for sciatica, an operation for unstable knee, Smith-Peterson's incision for exposure of the hip, Campbell's new shelf operation at the hip, and a new operation for acromioclavicular dislocation are described.

Gynecologic surgery is not touched upon in this work.

H. J. PRENDERGAST, M.D.

NEW AND NON-OFFICIAL REMEDIES, 1940. Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1940. Cloth. Price, postpaid, \$1.50. pp. 656-LXVIII. Chicago: American Medical Association, 1940.

Each year a revised list of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association as of January first is published in book form under the title of "New and Non-official Remedies." The book contains the descriptions of acceptable proprietary substances and their preparations, proprietary mixtures if they have originality or other important qualities, important non-proprietary non-official articles, simple pharmaceutical preparations, and other articles which require retention in the book.

A list of articles and brands accepted by the Council, but not described, is included in the book to cover simple preparations or mixtures of official articles (U.S.P. or N.F.) marketed under descriptive, non-proprietary names for which only established claims are made. Diagnostic reagents which are not used in or on the human body, and protein diagnostic preparations are not included in New and Non-official Remedies unless the determination of the status of these products by the Council has been requested by the distributor: If such products are found to be marketed in accordance with the Council's rules, they may be included in the list of undescribed, but acceptable articles.

New and Non-official Remedies is a practical and condensed text of pharmacology and therapeutics; it contains scientifically elaborated standards for all accepted non-official drugs; its Index to Distributors is a list of manufacturers, a large number of whose products have met the Council's high standards; its Bibliographical Index is a storehouse of references to reports which have been made mainly on unaccepted and unacceptable drugs; its prefatory material contains the

Council's "Rules," a time-tested and reliable set of basic principles for the furtherance of scientific and rational medicine.

A supplement to the annual volume of New and Non-official Remedies is published twice a year to bring up to date such current revisions and additions as have been necessary since its last publication. Every product included in the book is subject to the official rules of the Council. The comments to rules are changed occasionally by way of clarifying interpretation to insure fair consideration of all submitted preparations as new standards are recognized. Such constant and critical consideration of its contents provides the physician with a valuable reference list of acceptable new preparations on which to base his selection for use in treatment according to the established current practices of the profession.

The 1940 New and Non-official Remedies, of course, contains the revisions which appeared in the supplements for the 1939 edition, and continues the plan of grouping together articles having similar composition or action under a general discussion. These discussions have undergone considerable revision in the 1940 edition. Further revision of statements regarding the actions, uses, dosage, composition, purity, identity, strength or physical properties of many of the articles has also been necessary in some cases. Noteworthy re-

visions are those of the chapter on Liver and Stomach Preparations, radically rewritten and including a statement of requirements suggested by findings of the Anti-Anemia Preparations Advisory Board of the U. S. Pharmacopeia; the subsection Tuberculin, entirely rewritten to conform to newer knowledge in this field; and the chapter Allergenic Protein Preparations, the name of which has been changed to Allergenic Preparations. Minor but relatively important revisions are found in the articles: Bismuth Compounds, Serums and Vaccines, and Vitamins and Vitamin Preparations for Prophylactic and Therapeutic Use.

The indices of the new volume of New and Non-official Remedies are of the same order and plan as in previous editions. A general index lists accepted articles, including those not described. This is followed by an index to distributors in which appear all the Council accepted articles listed under their respective manufacturers. Finally, a bibliographical index is added for listing proprietary and unofficial articles not included in N.N.R. This includes references to the Council publications concerning each such article as has appeared in *The Journal of the A.M.A.*, *Reports of the Council on Pharmacy and Chemistry*, *Propaganda for Reform*, Vols. 1 and 2, or *Reports of the A.M.A. Chemical Laboratory*.

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CASE REPORT

HISTAMINASE IN THE TREATMENT OF URTECARIA OF PREGNANCY

(Continued from page 797)

cluding phenobarbital, bromides, nembutal were used in large doses to alleviate the marked distress of the patient who, by this time, was getting very desperate. The condition became so severe that therapeutic abortion was seriously considered as the patient's mental condition was steadily deteriorating and the skin was one mass of urticaria wheels and excoriations.

On March 11, 1940, histaminase was tried. Ten units were given with water four times a day before meals. Within twenty-four hours the skin became quite clear and the itching a great deal alleviated though not entirely gone. By keeping on this regime, a fair amount of comfort could be obtained. On March 27, 1940, the patient had a painless hemorrhage. A diagnosis of placenta previa was made and a cesarean section was performed by Dr. A. Hoaglund. Twin girls were delivered without complications and a central placenta

previa was found. Immediately after delivery, the urticaria and itching disappeared entirely though the histaminase was discontinued just previous to operation.

Comment

A case is reported of urticaria of pregnancy which was apparently helped by histaminase after all other means tried had failed to give any relief.

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CLASSIFIED ADVERTISING



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FOR SALE—Well established general practice, central Minnesota, town of 650, Scandinavian, largely dairy farming. Collections average \$7,500. Easy terms. Equipment includes x-ray, fluoroscope, Bucky, diathermy, ultra-violet, infra-red, metabolism machine, microscope, drugs, trial case, fracture equipment, etc. Will introduce. Specializing. Available, June, 1941. Address C-43, care MINNESOTA MEDICINE.

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POSITION WANTED—Nurse graduated in Switzerland. Ten years' experience. Speaks French, German, Italian, Russian and some English. Desires position in sanitarium or doctor's office. Also interested in caring for children, infirm or old persons. Address C-46, care MINNESOTA MEDICINE.

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CLINICAL PHOTOGRAPHY, Lantern Slides and Photomicrography. Photographs and X-rays reduced or enlarged for manuscripts. **SCIENTIFIC PHOTOGRAPHIC LABORATORY**, 348 Hamm Bldg., Saint Paul, Minnesota. Telephone Cedar 7125.

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THE INDICATIONS FOR EXCRETORY UROGRAPHY*

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I CONSIDER it a great honor to present the Carman Lecture for the Radiological Society of Minnesota, especially when I recall the list of distinguished roentgenologists who have preceded me in delivering this lecture.

It was my good fortune and great pleasure to have known Dr. Carman intimately for a number of years. He was a great roentgenologist and clinician with a kindly, unselfish spirit. He was always willing to give any information he had which would be useful to his fellow practitioners and helpful to humanity. This great compassion and tolerance exemplified the character of Dr. Carman. He was a pioneer in radiology and contributed greatly to its success and development by his teachings and writings. It is with some timidity that I address you on "The Indications for Excretory Urography," for I feel that it will not be of sufficient quality to represent the man in whose name this lecture was founded.

The development of a media which can be introduced into the body and excreted by the kidneys greatly simplifies the diagnosis of diseases involving the urinary tract. Excretory urography makes possible the correct diagnosis and treatment of lesions which heretofore have not been diagnosed, or have been allowed to reach an advanced stage of development before their nature was determined. This examination can be carried out wherever a roentgenologist is available, which I believe is the case in the majority of hospitals in the United States.

The urinary tract frequently is the seat of disease without definite evidence of abnormal

changes. With symptoms closely resembling diseases of other organs, it becomes necessary to be "kidney minded." Abnormal changes in the urinary tract as a cause of symptoms must be excluded before surgical intervention, particularly in those cases without a clear-cut chain of symptoms of the disease for which operation seems indicated. Because of the complex structure of the sympathetic nervous system, fibers from the upper ureters, for instance, may refer pain to the gall bladder or colon. If a stone in the upper ureter moves further down the ureter, the reflex mechanism may transmit impulses to the appendix, ovaries and other organs. Many patients have been submitted to appendectomy when the correct diagnosis was found to have been a ureteral calculus or intermittent hydronephrosis.

A short history of the development of excretory urography may be of interest. Retrograde pyelography, or the visualization of the kidneys by the introduction of opaque media through a catheter, was introduced by von Lichtenberg in 1904, at which time he acted as the guinea pig for this experiment. Soon after, he realized the possibility of making such an examination by the introduction of the media into the blood stream. However, no practical application was developed until 1923, when Rowntree demonstrated excretory urography with the use of sodium iodide solution. When it was found, however, that this was not the ideal media for such an examination, von Lichtenberg's laboratories again began the study of media with urea bases and the combination of iodine, known as the selectan groups, and uroselectan was finally perfected by von Lichtenberg and Swick. Since

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that time other preparations, particularly skiodan and diodrast, have been used extensively and have produced practical results.

The application of these preparations in excre-

stricted during this time. The patients are not instructed to retain bladder urine which we think has some influence on the kidney function. This is the technic used in the routine examination.



Fig. 1. Woman, aged thirty. Soreness in the right upper quadrant for six to eight years. A mass the size of a grapefruit was palpated on the right side. No hematuria. Nephrectomy was performed, and the pathological diagnosis was hypernephroma. The patient was well eight years without recurrence.



Fig. 2. Man, aged forty-seven. Intermittent pain in upper left quadrant for five years which was relieved by lying down. Excretory urogram shows hydronephrosis of the left kidney. A plastic operation on the stricture of the upper ureter relieved symptoms. Subsequent nephrectomy was necessary, however, because of the recurrence of symptoms.

tory urography has varied greatly. After the introduction of the media into the blood stream, many attempts were made to block the ureters artificially, to place the patient in a Trendelenburg position, or to dehydrate the patient. Such procedures were attempts to produce results similar to retrograde pyelography, which is applicable only in a very limited number of cases, especially when a retrograde pyelogram cannot be done.

By excretory urography, we are able to demonstrate anomalies and actual pathological changes in the kidney pelvis and ureters. A study of the dynamics of the kidneys and ureters and the determination of the kidney function can be made with a fair degree of accuracy.

It is practical not to interfere with the natural functions of the patient, but to introduce the dye into the vein and make the initial examination of the urinary tract within the first five minutes. A second examination is made in fifteen minutes, and a third film is made in thirty minutes. The last film is made one hour after the injection of the dye. The patient's activity has not been re-

We are convinced that only by constant repetition of the technic of examination in case after case is it possible to estimate accurately the dynamics and the function of the kidneys and ureters. This standard method of examination is not so important as is the constant repetition of whichever method is adopted. If the patient has disturbed function, films are made at two and three-hour periods, which helps greatly in determining the pathology present. This method has been well described in "The Clinical Value of the Delayed Urogram," presented by Dr. Braasch at a recent meeting of the American Association of Genito-Urinary Surgeons.

The following are contra-indications for such an examination: (1) Advanced renal dysfunction; (2) advanced cardiac decompensation; and (3) allergy to iodide salt. Sensitivity to iodide is probably the most important contra-indication for the use of intravenous dye in excretory urography as some deaths due to an allergic reaction to iodides have been reported recently. A history of allergy is important, and a preliminary

test for allergic reaction should be made before the dye is introduced.

Urography is indicated: (1) In cases of advanced prostatic disease where cystoscopy is im-

plantations; (6) in the presence of vesical fistula, ureteral fistula, or vesical diverticulosis; and (7) in the presence of a stone in the ureter or kidney. If used when indicated, excretory urog-

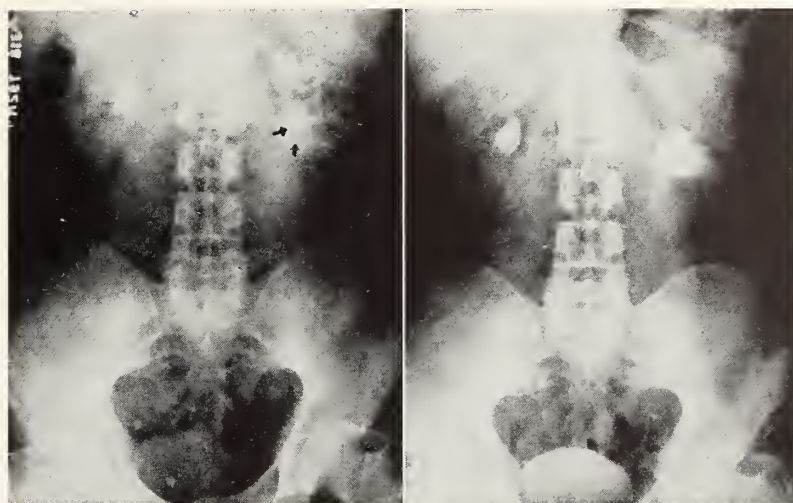


Fig. 3. *A.* Man, aged fifty-two. Recent accident to thorax and costal cartilage. A few red blood cells were found in the urine. The excretory urogram shows two non-opaque stones in the five-minute excretion from the right kidney. *B.* Thirty-minute excretory urogram obscures the stones. Pyelogram also obscured the stones.

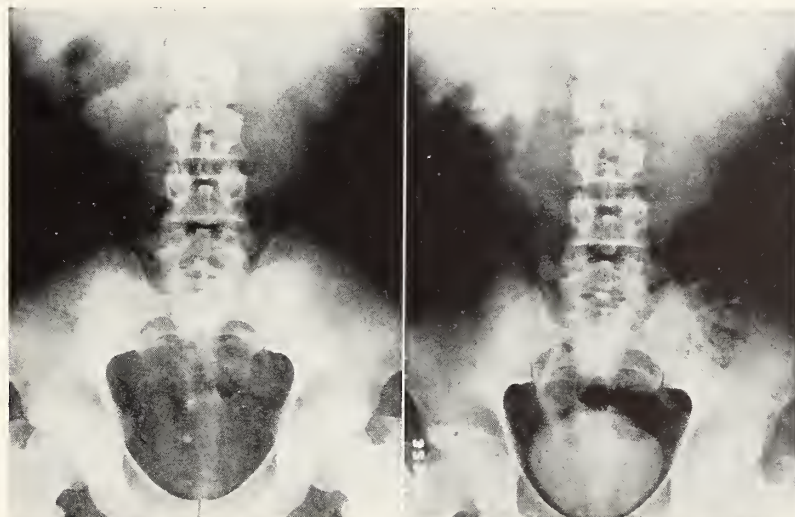


Fig. 4. *A.* Woman, aged forty-two. Roentgenogram showing a stone in the lower right ureter. *B.* Partial obstruction caused by the stone with dilatation of the ureter and hydronephrosis. Retention after one hour.

practicable or impossible and the study of delayed function is of great help to the surgeon; (2) in cases in which it is impossible to catheterize the ureters; (3) in young patients and in the aged; (4) in the presence of hydronephrosis, nephroptosis, trauma to the kidney or ureters, and congenital anomalies; (5) in ureteral trans-

raphy makes possible the accurate diagnosis of a large group of urological diseases.

In a great majority of cases of a palpable mass in the abdomen (Fig. 1), it is possible to determine by excretory urography whether or not the kidney is involved. If the kidney is normal, the mass must be accounted for by other path-

ologic changes. Such an examination may reveal a ptosed or ectopic kidney, a tumor in the kidney, or a large hydronephrosis, all of which usually can be visualized on the excretory urogram. In-



Fig. 5. Woman, aged forty-two. A stone was removed from the ureter in 1934. Excretory urogram three years later shows a marked hydronephrosis on the right side.

termittent pain in the abdomen which may simulate gall-bladder disease or duodenal ulcer is frequently encountered and may offer a difficult diagnostic problem. Such atypical attacks of colic are often due to a mild, intermittent hydronephrosis, which may be determined best by an excretory urogram (Fig. 2). If the disease is only moderate in degree, a retrograde pyelogram may not always determine the presence of a hydronephrosis. However, kidney retention after the one-hour period may be indicated on the excretory urogram.

When roentgen examinations of the colon show no disease, symptoms referable to the colon may be due to a stone in the ureter, an opaque or nonopaque stone in the kidney, or any lesion of the kidney which may produce referred pain to the colon. Frequently, the primary lesion for a nodular infiltration in the chest cannot be determined. If the masses are large, a hypernephroma of the kidney should be considered. A destructive lesion in the bone might be a metastatic hypernephroma, and an excretory urogram in most instances will determine the presence or absence of such a lesion. The same pro-

cedure also applies to the determination of the etiological factors in an obscure anemia.

A large group of our patients with definite lesions of the kidney have had a normal urine, and the above group of cases are assumed to have been free from definite urinary symptoms.

As hematuria and pus in the urine are due to pathologic change in the urinary tract, an excretory urogram may be of help in locating the disease. However, such obviously urological cases should be referred to the urological department for cystoscopy. Excretory urography may be indicated in back pain of obscure etiology. A nonopaque stone in the kidney, a ureteral stone, a tumor of the kidney, or hydronephrosis occasionally may be the cause of such an attack of pain. The varying degrees of density of the excretory urogram from concentration of the opaque media in the pelvis (Fig. 3 A and B), will often reveal on the five minute film a stone which might be obscured entirely after one-half or one hour intervals. Likewise, the stone may be obscured by retrograde pyelography.

If the ureter is not completely blocked with the resultant nonfunctioning of the kidney, stones in the ureters (Fig. 4 A and B) are studied best by an excretory urogram. Such an examination determines whether or not the kidney is functioning, and the degree of such function. By this method, it is possible to determine the extent of damage to the corresponding kidney when the ureter contains a stone and is partially obstructed. From the patient's standpoint, the excretory urogram determines whether the physician may procrastinate, or whether the stone should be removed immediately. However, this problem should be decided by the urologist. In the presence of a stone or stones in the kidney, excretory urography to determine the presence of intermittent obstruction, or the amount of kidney damage (Fig. 5), will indicate whether or not it is advisable to delay treatment of such a condition.

Excretory urography during pregnancy may determine the cause of backache and other obscure symptoms. In such cases, the usual excretory urograms are made in the first hour period, to be followed by a film two hours after the introduction of the dye. This method will determine the degree of ureteral dilatation which often accompanies pregnancy, and may demonstrate a

marked degree of hydronephrosis in one or the other kidney.

In children with frequent urination, an early excretory urogram may reveal congenital diseases in the urinary tract. Proper treatment in an early stage may entirely relieve their symptoms and often save their lives. Likewise, large tumor masses in the abdomen in children may be located by an excretory urogram. The procedure for excretory urography in infants as described last year by Nesbit and Douglas¹ has been a great help in some diagnostic problems in children.

The purpose of this discussion has been to show some of the important procedures for the diagnosis of obscure clinical symptoms by examination of the urinary tract with excretory

urography. However, this carries with it a great deal of responsibility, and, in undertaking the interpretation of such examinations, the roentgenologist should have a wide knowledge of the pathologic changes found in diseases of the urinary tract which are demonstrable on the roentgenogram, as it is obvious that error in diagnosis may be worse than any attempt at such an examination. When properly evaluated, however, excretory urography constitutes one of the most valuable procedures in modern clinical diagnosis.

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ENDOCRINE DISTURBANCES IN RELATION TO SKIN DISEASES*

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ENDOCRINE disturbances exert a powerful influence on the skin and its appendages and the cutaneous changes afford considerable diagnostic aid in many of the classical endocrinopathies. A review of these diseases will point out most of the important endocrine influences on the skin.

In both hypersecretion and hyposecretion of the thyroid gland and adrenal gland, the function and structure of the skin are disturbed. A dry, coarse skin and brittle nails are observed even in mild hypothyroidism and in well developed myxedema the thickened skin is still more diagnostic. In contrast, in hyperthyroidism the skin is moist and fine. Diffuse alopecia may be found in both conditions. In adrenal cortical hypofunction (Addison's disease) hyperpigmentation is almost always present and is often the most striking sign, while with overactivity of the adrenal cortex the skin may be red, dry and coarse and in some cases acne and hirsutism are prominent features of the disease. Acromegalic individuals present coarse hirsutism and pigmentary changes associated with a dry, thickened

skin showing hypertrophy of both epithelial and mesenchymal elements, occasionally manifested by the appearance of cutis verticis gyrata. In Cushing's syndrome (basophilic adenoma of the pituitary) hirsutism, acne and striae are characteristic features. Simmond's disease, resulting from loss of function of the pituitary gland, is associated with a dry skin and loss of hair. Disturbed sexual function is also observed with gonadal and adrenal cortical tumors and hirsutism may be an early sign of such disturbance. Similar characteristics are associated with tumors of the thymus or pineal body where the general overdevelopment of the body results in premature pubescence.

Analysis of these classical endocrine disturbances shows that most of the cutaneous anatomic structures and functions are directly influenced by endocrine associations. The endocrine influence on pigmentation is of the greatest importance, the adrenals having undoubted dominance over pigment production while the pigmentary changes evident in thyroid, ovarian and pituitary disease are probably due to the influence of these organs on the adrenal glands. Direct pituitary influence on pigment production in man has not been proved, though in cold-blooded vertebrates

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the secretion of the intermediate portion of the pituitary gland has been clearly shown to influence the functional erythro-, melano-, and xanthophores.

That the character, growth and distribution of hair are more influenced by the endocrines than by any other factor may also be deduced by analysis of the classic endocrinopathies. Clinical observation and experimental studies suggest that the texture of the hair is controlled mostly by thyroid function, growth is chiefly subject to the pituitary gland and the distribution of hair is a result of gonadal activity.

Endocrine influence on the skin is by no means limited to the direct relations already enumerated. The general growth and development of the body are influenced and perhaps dominated by the pineal and the thymus. Metabolic activity is subject to thyroid function, the pituitary gland regulates water balance in the tissues and influences the metabolism of carbohydrates and lipoids, while final mastery of carbohydrate metabolism is given to the pancreas. If recent work on pancreatic hormones can be accepted then cutaneous lipoidoses and perhaps psoriasis can be related with the endocrines. The blood platelets and possibly other elements of the blood are influenced by the cyclic changes of menstruation. When one reviews these actions of the endocrine glands on the functions of the general tissues of the body, one is amazed that even more cutaneous diseases do not exhibit a closer association with endocrine disturbances.

The skin is directly influenced by vitamin deficiencies but also indirectly through their action on the gonads and possibly on other glands.⁸ A number of cutaneous diseases are characterized by sensitivity to light and endocrine disturbances are probably related to this type of sensitivity.⁵ Cutaneous hypersensitivity, in a broader sense, accounts for a large share of dermatologic conditions and the association between allergy and endocrinopathy has possibilities that have not yet been explored. That some interrelationship is present can not be doubted; hyperthyroidism is known to exaggerate allergic symptoms and estrogenic activity apparently decreases allergic tendencies.⁷

In the group of diseases which Becker regards as neurodermatoses there are many signs of endocrine activity; of these, the lowered blood pressure, vascular dilation or constriction and

emotional changes are most significant. The lowered metabolic rate is further evidence of such association. Both the central nervous system and the autonomic system are subject to hormonal influence and it is evident that perception of pain and itching are not free from endocrine control.

To review briefly, endocrine disturbances relate to skin diseases in a variety of ways. Specific influence of a number of the glands of internal secretion is manifested obviously in the classic examples of endocrine disease. Under less pathologic conditions there is nearly complete control over many cutaneous functions, especially hair growth and pigment production and all the tissues are influenced by the endocrine relation to water balance, metabolism, avitaminosis and allergy.

Clinical observation of numerous cutaneous diseases shows that the integument is affected even further. The spontaneous regression of ringworm of the scalp at puberty, the development of striæ in pregnancy and the herpetic and urticarial eruptions of pregnancy cannot be easily explained by the mechanism so far described. In other diseases the association may be less obvious but no less important.

Since the hormones act on all tissues, one might expect endocrine influence in those cutaneous diseases which are essentially systemic. Detailed discussion is of doubtful value because so little is yet known but syphilis is one disease which is without doubt influenced by the endocrines. The difference in the course of syphilis in the sexes and the favorable influence of pregnancy are well established clinical observations. In experimental studies a number of endocrine influences have been noted. As reviewed recently by Kemp⁴ one finds: (1) a more severe course in male animals; (2) a favorable influence through pregnancy; (3) the course modified favorably by administration of theelin; and (4) castration resulting in a less severe course. The importance of these observations is very evident but the instability of this knowledge is underscored in the next pages of the same journal, where Hu³ reports contradictory results after castration.

In contrast with the endocrine influence on systemic disease, an extensive systemic disease may influence the glands of internal secretion. Generalized exfoliative dermatitis exerts such a

general systemic influence and in association with this disturbance a number of endocrine abnormalities have been demonstrated. It has been suggested that these abnormalities might be the cause of the cutaneous involvement² but it appears more likely that they may be the result of the extensive disturbance of the functions of the skin.

Dermatoses Affected by the Endocrine Glands

We come now to a consideration of those dermatoses influenced by endocrine activity. It may be well to classify them into: (1) those essentially endocrine in nature; (2) those diseases where endocrine influence is obvious though other factors may be equally or more important; and (3) the cutaneous diseases where endocrine disturbance is probably or possibly of importance.

Among the cutaneous changes which are essentially endocrine are all those processes associated with the classic endocrinopathies which were enumerated at the beginning of this paper. There are in addition the more circumscribed lesions which occasionally serve as diagnostic aids in diabetes and thyroid disease. In necrobiosis lipoidica diabetorum, as in diabetic xanthomatosis, the cutaneous lesions do not result directly from endocrine influence but rather indirectly through the disturbance in nutritional metabolism (hyperlipemia). Localized myxedema is less easily explained. The characteristic nodules and plaques on the lower legs are associated with clinical hyperthyroidism but in a few cases having a more generalized distribution, the administration of thyroid substance has been followed by improvement.

There is some doubt as to the propriety of listing acanthosis nigricans as essentially endocrine, but the cutaneous as well as systemic changes are somewhat comparable with those of Addison's disease. Chromaffin tissue insufficiency is demonstrable in both conditions, but in Addison's disease the cortical hypofunction is more evident. Hemochromatosis shows resemblance to both these diseases. Though the pigment is not of cutaneous origin its deposition in the skin is often a diagnostic aid and the presence of diabetes justifies placing this condition with those having endocrine significance.

That there is a relation between the endocrines and hypertrichosis is almost certain, though in

the mild examples the endocrine abnormality may not be easily demonstrable. In more severe cases of hypertrichosis it is common to obtain a history of menstrual abnormality or thyroid disease present at the onset even if not evident at the time of examination. Certainly one should never employ electrolysis until a complete history and examination have indicated that a pituitary, ovarian or adrenal tumor is not present.

The association between the endocrines and the loss of hair is not so clear. Certainly there is no adequate proof of such a relationship in alopecia areata or in the "hereditary" type of baldness. Therapy with pituitary gland extracts failed to live up to expectations. There remains a possibility that baldness is an hereditary trait associated with some type of mild endocrine dysphrophy.

A number of rather vague and indefinite dermatoses are associated with the menses and thought to be more common when menstrual disturbances are present. It is possible that many such cases in the older literature were unrecognized examples of dermatitis medicamentosa resulting from the repeated use of analgesics or antispasmodics. The characteristic menstrual dermatoses have a tendency to occur on the face or the extremities and in many cases their urticarial or eczematous appearance suggests an allergic mechanism. The reports of clinical studies of attempts at desensitization have not been very convincing.¹ The occasional occurrence of menstrual purpura may result from the cyclic changes noted in the blood (low platelet counts) or from changes in the permeability of the cutaneous vessels.

The endocrine changes taking place at the menopause are so extensive and so variable in degree and duration that one would expect more numerous cutaneous changes to accompany them. "Hot flashes" and edema are commonly met with but are not of dermatologic interest. Pruritus is occasionally observed. Other cutaneous diseases are often aggravated at or just before the menopause but perhaps the only dermatosis characteristic of this period is keratoderma climacterium, often associated with obesity, arthritis and hypertension. The circumscribed hyperkeratotic papules on the palms and soles bear some resemblance to the keratotic changes seen in acromegaly and in hypothyroidism. The

administration of thyroid medication is reported to have a favorable action in some cases; theelin should also be given a trial.

Kraurosis vulvæ and the somewhat comparable conditions in the male appear to have a distinct relationship with the menopause and other sexual changes, though endocrine therapy is usually unsuccessful. The physiologic atrophy of the external genitalia which normally follows the menopause should not be confused with kraurosis though it doubtless has been so confused, particularly in cases where pruritus or leukoplakia were also present.

The relation of endocrine disturbances to anal and genital pruritus is far from clear. There is no doubt that the changes associated with the menopause are of importance in many cases of vulvar pruritus but in only a few cases does complete relief follow the use of endocrine therapy by injection or inunction. The general pruritus accompanying the structural and functional changes of senile skin is endocrine in a general sense though both local and systemic therapy have been of little avail.

A number of cutaneous changes are associated with pregnancy. Hyperpigmentation (linea nigra) and striae are normal accompaniments and the chloasma of pregnancy is common; the latter usually disappears within a few weeks after termination of the pregnancy. Multiple small sessile or pedunculated fibromas occasionally develop during pregnancy and usually regress or disappear on its termination. Localized or generalized telangiectases or angiomas are rare accompaniments of pregnancy. Urticaria and herpes gestationis are not common and should probably be regarded as manifestations of a toxemia. The urticaria of pregnancy may be mild and transitory but in a few cases it is extensive and the pruritus may be uncontrollable. Herpes gestationis so closely resembles dermatitis herpetiformis that many observers regard them as identical. Even in the more common herpetiform dermatitis, there is frequent association with the menses or some distinct endocrine abnormality.

There must be a relationship between endocrine disturbances and the several seborrheic states. Between acne and endocrine function there is an association but there is little evidence as to its nature. Endocrine therapy for acne has been particularly disappointing when ap-

plied routinely, though thyroid substance, estrogens, and occasionally ovarian extract, are beneficial in selected cases. There appears to be some relation between rosacea, menses and the menopause but endocrine therapy is unsatisfactory. Extensive chronic seborrheic dermatitis is not infrequently associated with endocrine disturbances but it is not known whether the relationship is causal or whether there is merely a common association with some other underlying factor.

The structure and activity of the apocrine glands are surely influenced by hormones and Fox-Fordyce disease and suppurative hidradenitis are thus subject to endocrine relations. To what extent they may be regarded as endocrine disturbances remains unanswered.

Since dryness of the skin is often a sign of endocrine disturbance, it is only natural that ichthyosis should have been suspected of a similar association. Careful study of such cases fails to demonstrate any relationship and the results of endocrine therapy are usually unsatisfactory.

Pityriasis rubra pilaris and epidermolysis bullosa may also be mentioned as having an hereditary influence and are thought by some to be of endocrine etiology, though there is little proof and the results of endocrine therapy are unsatisfactory. Vitiligo is now in a similar category but it is more possible that future studies may demonstrate some endocrine dysfunction associated with this pigmentary abnormality.

Scleroderma has long been suspected of endocrine significance and not rarely it is reported in association with one or several endocrine dysfunctions. The administration of thyroid substances and in some cases the use of estrogenic or pituitary extracts appears to be followed by improvement. The experimental studies which suggested a relationship with the parathyroid glands have not been supported by further evidence but future study may clarify this distressing disturbance.

In connection with the parathyroid glands, one must mention calcinosis because these glands have so great an influence on calcium and phosphorus metabolism. In the majority of cases of calcinosis cutis the condition seems to be a local degenerative change rather than a systemic disease; in the few cases where it is a result of systemic disturbance, it has been impossible to incriminate the parathyroid glands. There is some evidence that impetigo herpetiformis is

associated with parathyroid deficiency and responds to therapy with parathyroid extract.

Through the autonomic nervous system the adrenal glands and possibly other endocrine structures have a considerable effect on the vascular supply of the skin and on numerous dermatoses, particularly those of the face and extremities. It is certain that the following conditions are thus modified or even given predisposition: livedo, acrocyanosis, erythema induratum and various forms of pernio. There is some evidence that acrodynia is closely associated with adrenal cortical disturbance.

There are undoubtedly numerous additional dermatoses where endocrine influences might be suspected of playing a part, but I have attempted to confine my discussion to those where such relationship seems evident though not necessarily proved. In considering this group of cutaneous diseases, it would be strange if subsequent advances in knowledge should not find me mistaken in many of my judgments.

Therapy

In spite of the many examples of endocrine relation to cutaneous disease the dermatologist needs little knowledge of endocrine therapeutics. In the cutaneous disturbances associated with the classical endocrinopathies, dermatologic assistance is chiefly diagnostic.

In the specific dermatoses known to be related to the glands of internal secretion, the endocrine disturbance is rarely amenable to therapy. In most of the dermatoses associated with pregnancy few would yet be bold enough to introduce endocrine therapy. My opinion as to the relative unimportance of hormonal therapy in acne has been expressed elsewhere;⁶ in the great majority of cases of acne, rosacea or seborrhea, treatment by other means is more successful; in the few cases with demonstrable endocrine abnormality, thyroid substance, ovarian extracts, estrogenic or possibly even androgenic agents may be successful.

It is with the menstrual dermatoses that endocrine therapy may soon have its greatest application but present chemical and biologic methods of study usually fail to demonstrate the exact nature of the underlying disturbance. In those cases with additional clinical evidence it is less difficult to select the proper therapeutic agents.

If some dermatologists do not agree that ther-

apy should be left to the endocrinologists, it may be well to recall the dermatologic attitude toward the indiscriminate application of antisyphilitic drugs in years past. During the stage of development of therapeutic modalities as powerful and yet as little understood as some endocrine substances, it is best that the indications, dosage and technic be developed among one group of clinicians, later to be applied by all practitioners, as is now true with antisyphilitic agents. Endocrine therapy is becoming increasingly more rational and it is not unreasonable to hope that by the time the true association between numerous dermatoses and endocrine disturbance has been demonstrated, the proper application of therapy will not be difficult. In the meantime, the haphazard application of endocrine therapy is of little help to the patient and certainly no aid to the progress of dermatology.

Summary

Since almost every type of endocrine disturbance has some visible effect on the skin and the normal character of the skin is dependent to a large degree upon a normal endocrine system, one would expect numerous dermatoses to be closely allied with endocrine disturbance. In practice a close alliance is seldom demonstrable, though in a number of cutaneous diseases there is a distinct endocrine influence. The very large number of dermatoses whose cause and pathogenesis are unknown leaves the possibility that some may be essentially endocrine but there are only a few where this appears likely. Although it is possible that more numerous chemical and biologic studies might demonstrate such a relationship, it seems more likely that newer methods of study must first be developed.

A more rapid advance in knowledge of the obscure actions of endocrines on the skin is delayed by the expense connected with experimental work in this field and by the lack of dermatologists capable of doing this work. There is slight consolation with less rapid advances in that there will be fewer errors requiring correction later. The irregular and frequently inexplicable course in even the better known endocrine disorders should make one suspicious and not too enthusiastic in observations on the course or the treatment of individuals or small groups of patients with dermatologic disorders of doubtful endocrine significance. Reports un-

accompanied by chemical or biologic studies must be reviewed in a most critical light. In connection with the favorable reports on the use of estrogenic agents in numerous dermatoses and with desensitization in acne and "menstrual dermatoses," critical analysis and confirmation should precede general acceptance and application.

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MATERNAL MORTALITY AND FORCEPS DELIVERIES

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IN THE delivery of obstetrical patients, efforts are continually being made to combat infections at their source. Rectal examinations in the course of labor and locating the heart beat to diagnose the position of the fetal head are replacing vaginal examinations of former days. Other measures to insure antisepsis and asepsis include sterile draping of the patient, a ten-minute scrubbing period before putting on sterile gloves and gowns, and the wearing of masks over the nose and mouth by nurses, interns and the attending physician.

And yet, little emphasis is placed upon such a potential source of maternal infection as the application of obstetrical forceps. In 1931, at the White House Conference, Plass³ reported that, in a series of 145,812 obstetrical cases, forceps were used in 17.9 per cent. Not only is infection introduced by the operator's hands or the instrument itself, but the forceps traumatizes the mucosa and musculature of the generative canal, and thus reduces the blood supply and vitality of the tissues, creating an ideal culture medium.

One application of the forceps may carry infection into the vaginal tract and uterus. Additional applications multiply the likelihood of infection. Yet, De Lee,² in the latest edition of his book on "Obstetrics," describes a method of rotating the head from an occiput posterior to an occiput anterior position, 180 degrees, through forceps manipulations in which four separate applications are required. Vedder⁵ advocates the use of the Kielland forceps for such a maneuver.

But in the method he advises, the forceps are re-applied for each three to five degrees of rotation accomplished, thus necessitating between 30 and 60 different applications of the forceps.

Certain factors, such as pelvic types and different presentations of the fetus make the use of forceps imperative. For instance, in the android and anthropoid types of pelvis, Caldwell¹ and his associates found it necessary to reverse the Scanzoni maneuver and rotate the occiput anterior presentation to the occiput posterior position by forceps manipulations. This occurred in 23.2 per cent of their series of 215 cases.

These two types of pelvis have compensatory space posteriorly, the anterior part of the inlet being narrow. A small baby frequently will come through. But, if it passes the inlet in the posterior position, difficulty in rotation usually occurs. Consequently, when these pelvic types are recognized, the operator will find delivery of the head with forceps in the persistent posterior position the method of choice.

Furthermore, it is mechanically wrong to attempt the rotation of the fetal head from a wide diameter through a narrow one. This principle holds true in the delivery of the aftercoming head of a version and breech extraction. Hence, if it is possible, it is logical to rotate the head to an occiput posterior position in the inlet itself in order to deliver the head with the occiput posterior. Titus,⁴ in his latest book on obstetrics, advocates this procedure in the delivery of the android and anthropoid types of pelvis.

Moreover, the application of any of the forceps now in use, all of which have a fixed pelvic curve, does not allow the head to flex, extend or rotate during traction on the forceps. As a result, unnatural relations occur in the birth canal during traction with forceps. Both trauma to the baby's head and to the mucosa and musculature of the generative tract result.

With these basic and other corroborative facts in mind, the author felt there was adequate cause for continued study and improvement of all known methods of forceps usage and construction. Broadly, the question presenting itself was, "How might forceps be designed and used in order to reduce maternal, natal and neonatal deaths?" Infection and reapplication of forceps seemed the principal criteria from which arose the problem, "What are the requirements in forceps design?"

Since delivery by forceps occasions unnatural relationships between the passenger and the passage, it is the task of the designer to have forceps made in such a way that they comply as closely as possible with the natural factors which effect birth. In this connection, two essentials must be kept in mind. In the first place, it is best for both mother and child to terminate any forceps delivery as quickly and simply as possible. Secondly, as is true for all operative instruments, absolute asepsis is requisite.

On these premises, the technical problem may be summarized in the following points:

1. Rotation of the child's head should be unrestricted by the operator's grip on the forceps handle. This might be avoided by a universal joint.

2. Movement of the head in the longitudinal axis of the birth canal requires a flexible forceps to avoid injury.

3. Pressure of the blades on the head should be reduced to a minimum. The head, while in the forceps, should be free to flex, extend and rotate during traction.

4. The usual stiff bond between the head of the child and the operator's hand should be eliminated by a full universal joint.

5. Reapplication of forceps should be reduced to a minimum, which it would be by inclusion of a universal joint.

6. Simple construction, safety of manipulation and absolute asepsis are imperative.

7. The forceps blade should automatically change its pelvic curve during any rotary movement in order to follow the curve of the bony pelvis.

8. It should be an all-purpose forceps incorporating ease of application and axis traction.

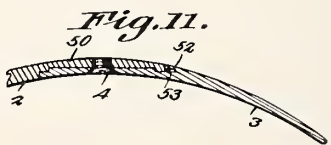
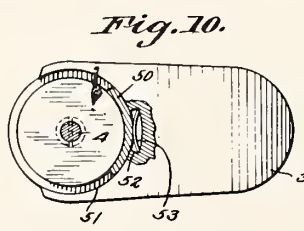
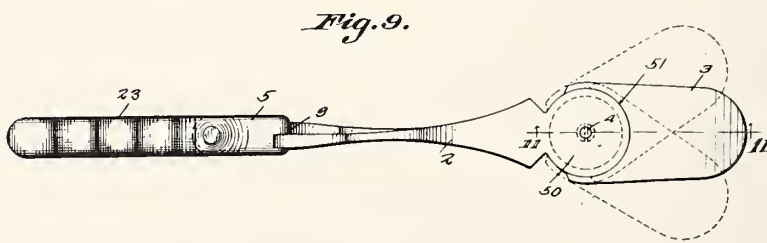
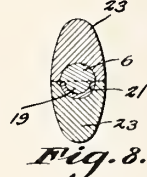
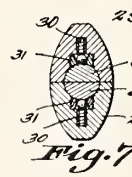
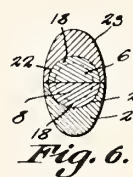
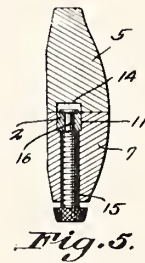
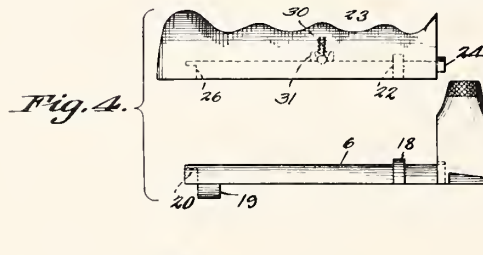
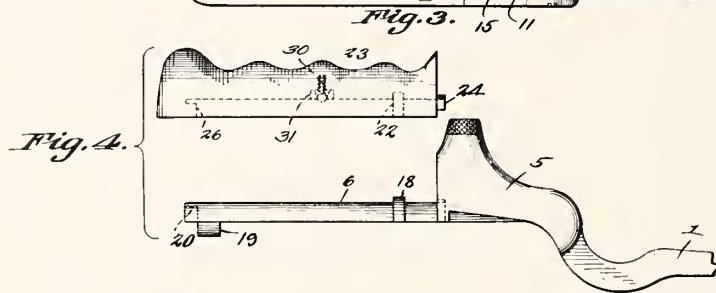
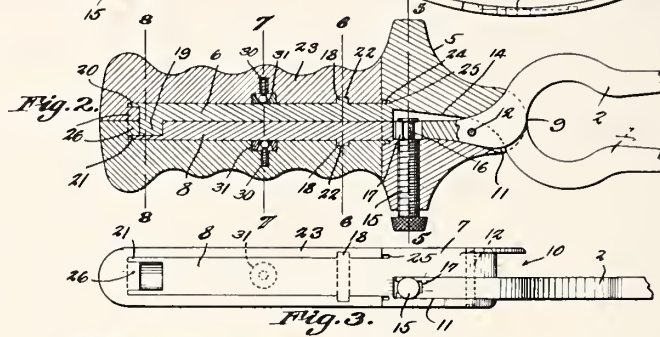
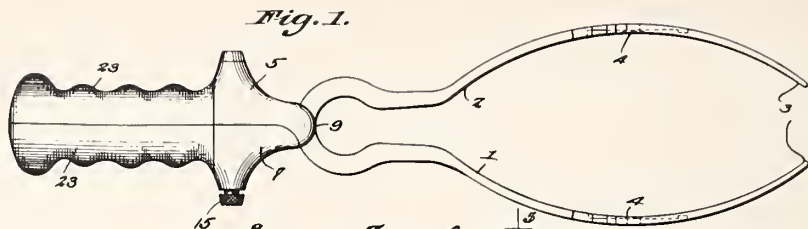
9. It should give equal dilation of all parts of the vaginal canal during traction, thus preventing deep muscular tears into the rectum.

10. By avoiding the necessity of reapplication, it should eliminate reversion of the head to its original position during rotation.

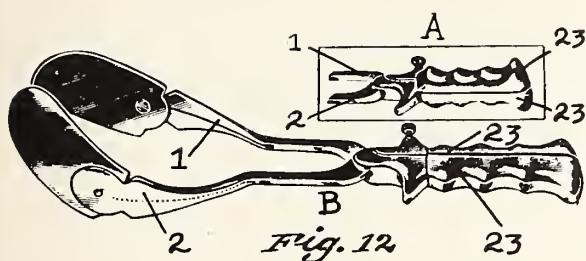
Among previously designed forceps, there is not one which solves the problem of flexion, extension and rotation of the child's head in such a manner that the entirely unhindered, yet powerful work of pulling can take place. This fact is most obvious in the forceps that have been most practical and applicable. Actually, in the most common case in which delivery with the aid of forceps is necessary, the head must rotate and the entire forceps must rotate with it. There is also no provision for flexion or extension of the head with the ordinary forceps.

With most forceps, if the operator resists the rotary tendency, the head, due to the pressure exerted upon it by the walls of the birth canal, must turn within the blades. If the physician rotates the forceps now in use, the head is injured by the blades and the soft parts of the birth canal are torn. These damages might result, even though the head is held in the forceps in the seemingly correct position. When the pelvis is normal, the forceps case may progress satisfactorily. But, if there is a deformed pelvis, the ill-effects of a so-called normal position become obvious.

Then, too, if the blades of the forceps serve only to hold the head tight or firm, as in the so-called axis traction forceps in which the handles are locked in a position by a screw and wing bolt while a special traction handle is attached to the blades, the head has more room for rotation. In this manner, it is easy to secure rotation despite the addition of extra metal arms which are awkward, difficult to apply and now seldom used. If, however, the physician holds the traction handle tightly, he hinders rotation, even though it is easier to follow the natural movement of the head with this instrument than with ordinary forceps. The one advantage of the old axis traction forceps is that by separating the pulling



mechanism from the clamping mechanism, the side pressure of the blades is reduced to a minimum. With the ordinary forceps, such as the Simpson or De Lee type, the attendant must



clamp the head with the handles while, at the same time, pulling them. It can be seen that even in the hands of the most expert, it is inescapable that the head will be compressed more than is really desired, due to the need for keeping a firm grip in the forceps.

With these criteria for the ideal forceps and the faults or disadvantages of other forceps in mind, the author has designed a new forceps, the primary object of which is reduction of fetal, maternal and neonatal mortality. These new forceps resemble De Lee's modification of the Simpson forceps. They are as easily applied, and the blades, being thinner, will occupy less space in the birth canal. The possibilities of free rotation, flexion and extension of the head, as well as the insertion of an elastic mechanism for the purpose of overcoming the friction of the head, is the goal sought.

In the Drawings

Figure 1 shows in top plan, a pair of obstetrical forceps constructed in accordance with the invention.

Figure 2 is a longitudinal section wherein parts appear in elevation.

Figure 3 is a plan view showing one member of the forceps, parts being broken away.

Figure 4 is a composite elevation showing one of the lever members of the forceps, and its grip, in spaced relation to each other.

Figures 5, 6, 7, and 8 are cross sections taken, respectively, on the lines 5—5, 6—6, 7—7, and 8—8 of Figure 2.

Figure 9 is a side elevation illustrating different positions which the blades may assume during the rotation of the head from occipital posterior to occipital anterior position, or vice versa.

Figure 10 is an elevation of one blade, wherein parts are broken away.

Figure 11 is a section on the line 11—11 of Figure 9.

Figure 12B shows position and grooves of blade locks that slide in shanks No. 1 and No. 2 for locking and releasing blades.

The forceps illustrated comprises levers 1 and 2, terminating in circular, disklike heads 50, received in correspondingly shaped recess 51 formed in blades 3, the blades and the heads being connected by pivot elements 4, for swinging movement in a direction at right angles to that in which the levers open and close. The blades are capable of assuming the positions shown in Figure 9, to facilitate (flexion, extension and) rotation of the head of the infant from occipital posterior position to occipital anterior, or vice versa. An undercut recess 52 is formed in each blade 3, and receives a bowed brake spring 53, bearing in its intermediate portion on the edge of the lever head 50 and preventing too free a movement of the blade under conditions well understood by those skilled in the art.

The lever 1 merges integrally into an enlarged body 5, having a rearwardly-extended, semi-cylindrical shank 6. A body 7 for the lever 2 is provided, and has a semi-cylindrical shank 8, corresponding to the shank 6 of the body 5. The levers 1 and 2 cross, as shown at 9, the bodies 5 and 7 of the respective levers being notched at their ends, as shown at 10, each to receive the other lever, a detachable fulcrum connection between the levers thus being afforded, as is common in the art.

The lever 2 can have relative movement, at the will of an operator with respect to the body 7, to produce opening and closing movement of the lever 2 with respect to the lever 1. This opening and closing movement is not to be confused with the opening and closing movement which the levers have at their place 9 of crossing.

The body 7 is supplied with a longitudinal recess 11, receiving the rear end of the lever 2, the lever being connected with the body, at a point intermediate the ends of the lever, and near the rear end of the lever, by a fulcrum element 12. The body 5 of the lever 1 is supplied with an internal recess 14, which, receiving the rear end of the lever 2, permits opening and closing movement of the lever 2 with respect to the lever 1, on the fulcrum pin 12. An adjusting member 15, such as a screw, is threaded into the body 7 of the lever 2, transversely thereof, the screw being provided at its inner end with a reduced neck 16, rotatably received in a notch or opening 17, formed in the rear end of the lever 2.

On their outer surfaces, the shank 6 of the lever 1 and the shank 8 of the lever 2 are supplied with transverse ribs 18, located adjacent to the respective bodies 5 and 7. On its inner or flat side, the shank 6 has a transverse, laterally projecting semi-cylindrical boss 19, and to the rear of the boss, the shank 6 is provided with a semi-cylindrical, trough-shaped flange 20. At the rear end, the shank 8 of the lever 2 is provided with a correspondingly shaped flange 21, receiving the boss 19 on the shank 6 of the lever 1.

On the shanks 6 and 8, grips 23 are mounted for rotation, transversely of the shanks, the grips having transverse grooves 22 which receive the ribs 18 of the shanks. At its forward end, each grip 23 is sup-

plied with a semi-cylindrical, trough-shaped, longitudinally-projecting flange 24, the flanges being received in correspondingly shaped grooves 25 in the rear ends of the bodies 5 and 7. Near their rear ends, the grips 23 have longitudinally extended, semi-cylindrical projections 26, the projection 26 of one grip being received within the flange 20 of the shank 6, and the projection of the other grip being received within the flange 21 of the other grip 7.

In order to prevent the grips 23 from turning too readily on the shanks 6 and 8, spring-pressed brake pins 30 are mounted for reciprocation in the grips, transversely thereof, the pins having rounded heads adapted to bear on the outer surfaces of the parts 6 and 8, the heads of the pins working through the conical bores of bushings 31, threaded into the grips.

By advancing or retracting the screw 15, the lever 2 can be adjusted in or out on its pivotal mounting 12, with respect to the lever 1, and the forceps, therefore, can be adjusted readily to the size of the head of the infant to be delivered. The grip structure 23-23 can rotate readily on the shanks 6 and 8, and thus the head has freedom to rotate within the pelvis, the head being permitted, automatically, to find the largest pelvic diameter. The device presents a structure wherein a full universal joint movement is possible. The rotary movement of the grips 23 may be regulated by exerting more or less transverse pressure upon them. The mounting of the grips 23 on the shanks 6 and 8 is such that by separating the shanks and rotating the grips, they can be taken off readily, thereby making it possible for the instrument to be taken apart and sterilized.

It will be noted, referring to Figure 12A, for instance, that if the trough-shaped grips 23 are rotated through an angle of 90 degrees, the grips will hold the forceps against opening. The physician, therefore, has within easy control a means whereby the forceps may be locked in position, against spreading.

These forceps may well be considered as new in both principle and design. The swivel, or ball joint bilaterally frees the head from any hindrance traceable to rotation, flexion or extension due to pull of the operator. The head can gradually and fully turn automatically to conform with the diameters of the birth canal in spite of the direction of the pull exerted upon it. Rotation of the head is due to the pressure of the soft portions of the pelvis, especially posteriorly. Rotation, then, is nature's attempt to adjust the fetal head to the compensatory space in the pelvis. It is possible to prevent any hindrance to the free rotation, flexion or extension of the head by the use of the new forceps. Thus, these forceps enable the replacement or substitution of natural labor powers by a forceps operation made to conform as closely as possible with natural conditions.

Most outstanding among the advantages of the new forceps is the fact that it is especially adapted to manipulate one of the abnormal positions, the occiput posterior position to occiput anterior position, or vice versa, when indicated. This is accomplished by rotating the head 180 degrees, if necessary, with but one forceps application. While this rotating movement is in progress, the blades automatically turn themselves to accommodate to the new pelvic position and to the pelvic curve. Delivery can be completed without changing the first application of the forceps or removing them. The fact that a second application of the forceps is not required during or after rotation, should minimize the chances of infections and trauma.

A lock is provided in the shanks to hold the forceps blades in a fixed position. This can be released by the operator after application of the forceps, thus allowing automatic free movement of the blades and the head during rotation and delivery.

An adjustment screw in the right handle can be set after application to a large head to prevent injury to the head from complete closure of the handles. One quarter turn of the outer handle 23, right or left, locks the blades on the head.

The new blades are designed to fit the head, and, consequently, all curves are cephalic. The blades automatically adjust themselves to the pelvic curve when necessary. This contingency is provided for by the joint near the center of the blades, which assists the blades automatically to adjust themselves to the pelvic curve during the movement of rotating the head from occiput posterior to occiput anterior position for delivery.

The author wishes to express his appreciation to the following obstetricians who have accepted the new forceps for trial and given time and effort in the various stages of its development: Drs. Paul Titus, N. J. Eastman, John W. Harris, A. H. Lahmann, H. H. Cummings, J. B. De Lee, Wm. Dieckmann, Fred L. Adair, R. M. Grier, Wm. E. Caldwell, H. C. Maloy, Hugh J. Tunstead, A. B. Hunt, and R. D. Mussey.

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THE CARE OF PATIENTS PRECEDING GASTRIC OPERATIONS*

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PATIENTS with gastric lesions should receive individualized preparation for operation. They usually have a long story of trouble and their lesion is chronic. They are usually past middle age before they require operation, they have been on restricted diets for a considerable length of time and may be suffering from the effects of inadequate intake or assimilation of food. All of these factors can make them quite dejected, a feeling which a growling pain in their midst does little to dispel.

Patients should be placed in a hospital for a time prior to any gastric operation, excepting in the presence of perforation. They should spend at least four days to a week in the hospital. During this period much can be done to correct difficulties which constitute in a large measure the dangers of the operation.

This brief review will be confined to pre-operative measures indicated for common surgical lesions such as chronic ulcers, polypi, and malignant tumors. Patients with other lesions or complicating illnesses may require further preparation. An excellent source of information on this subject is "The Stomach and Duodenum" by Eusterman and Balfour.

Patients otherwise in good condition without stomach retention and without anemia, require no special pre-operative treatment. They frequently are anxious and discouraged. They need rest, relief from pain and want encouragement. One can go a long way to relieve anxiety and to encourage these people by emphasizing a friendly interest. Proper attention to details which may not be important to the surgeon but are to the patient, an explanation to the patient of the course of the disease which has led up to the present need for operation, a careful description of the proposed surgical procedure without dwelling too much on the matter of malignancy or dangers and complications of the operation, will almost certainly produce a happier state of mind. The ulcer patients should be kept reasonably free from pain, should have rest even though opiates be required during this preparatory stage.

Operation on gastric ulcers which are thought to be benign is not resorted to until reasonable intensive medical treatment has failed to produce healing. What constitutes intensive medical treatment must necessarily vary with the individual and the lesion. We have no criteria or combination of symptoms and findings which tell us absolutely whether a gastric ulcer is benign or malignant. Hence we do not have the freedom to spend unlimited time hoping for medical cure.

That nutritional disorders are associated with gastric lesions is frequently evidenced by loss of weight, anemia and dehydration. These disturbances faults should be corrected as far as possible. Many patients are incapable of ingesting or assimilating sufficient food prior to operation, but their nutrition can almost always be improved. Aside from obvious nutritional disorders, we now have proof that individuals with gastric lesions are prone to develop less obvious disturbances due to vitamin deficiencies and insufficient plasma protein. Holman has found that 44% of all free clinic patients in San Francisco, where citrus fruits should be abundant, were deficient in vitamin C and 14% were on the borderline of scurvy. One suspects it may be a higher figure in Minnesota. Ingals and Warren found 90% of their ulcer patients had low ascorbutic acid values in the blood. Evidently ulcer patients are prone to develop this deficiency either because of faulty diets, improper absorption of vitamins, increased destruction of the vitamins, or a combination of these factors. One primary effect on the body of low ascorbutic acid blood values is an inability to manufacture and maintain certain intercellular substances including all non-epithelial cementing substances. It has been proven that wound healing is poor in scorbutic animals.

Anker and Graham found the cause of death to be peritonitis in sixteen of fifty-one patients who died after operations upon the stomach. In twelve of these the bacterial leakage at the site of anastomosis followed an almost complete absence of fibrous tissue response along the suture line. All of which strongly suggests that adequate vitamin C may provide the "missing link" in certain unexplained surgical failures.

*Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 23, 1940.

Holman further found that one half of his clinic patients showed vitamin A deficiency by the Hecht apparatus for stark adaptation. One effect of vitamin A deficiency is on the epithelial tissues, and we need not elaborate on the importance of healthy epithelium in surgical patients.

Vitamin B deficiency is difficult to measure but can cause atonic and weakened gastric musculature.

So it seems, then, that the pre-operative diet should include an abundance of vitamins. One satisfactory method of including this, is the daily administration of haliver oil, two capsules three times a day, four oranges and two lemons with the addition of the entire vitamin B complex in some form during the preoperative period.

Of late years evidence has accumulated that successful healing is dependent in some degree, at least, on sufficient plasma protein. Ravdin in particular has emphasized the resulting edematous stomach and disrupting wounds associated with lack of sufficient protein. Hence, we should attempt to raise the protein level to 7.5 gm. per 100 c.c. of blood before operation is undertaken. If the patient cannot ingest sufficient food, transfusion with whole blood is an effective means of increasing plasma protein.

Gastric retention is a frequent complication of these lesions and demands effective measures for control during the preoperative period. Eusterman outlines the signs and symptoms of retention as follows: "The outstanding features that denote need of treatment are dehydration, low output of urine, low blood pressure, shock-like prostration, high non-protein nitrogen content of the blood, low plasma chloride, enhanced CO_2 combining power of the plasma and in extreme cases tetany."

He further states as to the treatment: "In the management of gastric retention, feedings are given every two hours commencing at 6 A.M. and ending at 8 P. M. Each feeding consists of 200 c.c. of concentrated semi-solid carbohydrate food." Excluded from these foods are alcohol, meat broths, meat extracts and plain milk. Aspiration should be done three or four times daily before feedings, the frequency depending on the distress and amount of retention. At least 1,000 calories should be given daily. Many patients will be able to take more food and will require less frequent aspiration. As much food as possible for the patient to handle should be given

and the fluid intake should maintain the urinary output above 1200 c.c. per twenty-four hours. Certain patients will not tolerate sufficient food or fluid in this way and fluids must be given parenterally.

Occasionally, retention produces intoxication which may be very severe and may even result in tetany. Should intoxication be severe and tetany threaten, 5 c.c. of 10 per cent calcium chloride solution should be given intravenously, followed by glucose in saline. McVicar has shown how the poor condition of the patient with retention intoxication parallels the increase in blood urea, increase in CO_2 combining power of the plasma and a decrease in blood chlorides. The treatment consists of the administration of glucose and saline, combined with the measures previously outlined to relieve retention, until these factors approach normal.

The loss of weight and strength which accompany gastric retention frequently cannot be entirely replaced prior to operation. However, adequate fluid balance and reserve glycogen can be obtained, and intoxication controlled and the condition of the gastric wall improved by these measures.

Frequently these people have secondary anemia of varying degree. Sometimes this will require transfusion before operation. It is surprising, however, how well these patients with low hemoglobin values stand operation. Usually the effect of transfusion is more beneficial after the operation than before.

Occasionally repeated severe hemorrhage from a gastric lesion brings up the question of emergency surgical intervention to control the bleeding. This is always a grave situation and the matter of surgical treatment is, to say the least, debatable. Fortunately, with starvation, strict bed rest, and the use of opiates, the bleeding usually stops. Then the surgery, if indicated, can be delayed until a more favorable time.

Perforating lesions of the stomach may be subacute or "walled off" or a "slow leak." Usually these should be promptly attacked by surgical means as there is little hope that they will improve otherwise. Aspiration of stomach contents, continuous nasal suction drainage and the administration of fluids are indicated, prior to operation. If the perforation is old and considerable soiling with peritonitis has made the patient critically ill, the method used by Wangenstein of con-

tinuous aspiration, parenteral administration of fluids and subsequent drainage of the abscesses is probably safer than immediate intervention.

Acute perforation of a gastric lesion does not allow any time for preparatory treatment. Here of all places, procrastination, the desire to "make sure," the administration of fluids may cause a loss of time which more than any other factor is fatal. Aspiration of the stomach should be

done but lavage may well spread the contamination through the perforation.

Principles which apply to all surgical preparations should be followed in preparing for surgery on the stomach. High protein content in the pre-operative as well as the postoperative diet aids the healing of tissues. The mouth and upper respiratory tract should be cared for and be as free from infection as possible.

PRE-OPERATIVE PREPARATION OF THE DIABETIC PATIENT*

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THE diabetic patient should not be denied operative procedures because of his diabetes. He is a safe surgical risk if properly treated. Therefore, he should be allowed not only life-saving operations but those needed to make his life more comfortable. If it is a chronically infected gallbladder or appendix or hernia or relaxed perineum that needs to be repaired, there is no reason for denying such a procedure. It should be remembered that if infection is present, the diabetic condition becomes more severe, and in such instances, coma is more likely to occur. Therefore, in either chronic or acute conditions, we need to give the diabetic patient the same consideration as a normal person.

From the physician's standpoint once the diabetes is recognized the problem of treatment becomes more simplified. It is the unrecognized case that is found after surgical interference that has given the tragedy to this disease. The fault rests with the physician, and any normal surgical procedure should not be undertaken until after a complete urinalysis has been made. Remember that the patient may not be aware of his condition. This is true especially of elderly patients who have developed diabetes. Approximately one-third of the patients entering a large New York hospital were found to have diabetes for the first time when entered for a surgical condition. Only in severe infections is the treated surgical diabetic liable to die of his diabetes. It is rare for death to occur in the uncomplicated

case. However, anyone with a disturbed carbohydrate and, in turn, a disturbed fat metabolism can have a serious prognosis. It is for this reason that the coöperation between the medical and the surgical service must be very close, and the internist and the surgeon should have his definite duties assigned. Probably in a large institution the best method is to have one individual from the medical staff and one individual from the surgical staff responsible for the treatment. All cases fall into the following classifications:

1. Those in which the time of operation can be scheduled at a convenient hour.
2. Those in which the time of operation cannot be delayed, and the medical attendant must make every minute count.

Today it is generally agreed that the treatment of diabetes should be under medical management, that the best pre-operative and post-operative care is vitally important, and that, unless an emergency exists, two to three weeks should be spent in preparation for operation. In this period postoperative acidosis can be controlled completely. Each patient can be standardized on an individual diet with the necessary amount of insulin to keep acidosis and glycosuria under control. Today many cases can be controlled with only protamine zinc insulin, one injection being sufficient to cover all but slight glycosuria (one to two hours after one of the three meals). The patient in the first group should have a careful study of his cardiovascular system during this period including an

*Presented at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 23, 1940.

electrocardiogram, frequent blood pressure readings, and x-ray of the chest for any cardiac or lung pathology. The ideal time for operation should be determined by blood sugar studies. Probably a blood sugar of 140 to 170 mgs. per 100 c.c. of blood is the ideal level depending upon whether the individual is young or old. In the elderly individual do not attempt to keep the blood sugar at too low a normal level because of possible cardiac embarrassment. The following rules apply to this group:

1. The amount of glucose in the diet and the total amount of daily insulin should be determined.

2. Approximately three hours before operation, one-third of the total glucose (as determined above) should be given by mouth in liquid form only. If regular insulin is used, probably one-third of the regular amount (as determined above) should be given. If protamine zinc insulin is used, allow approximately one-half or two-thirds of the total amount of daily injections. Following this procedure, it probably is safer to return to regular insulin until the patient has recovered.

3. The urine should be examined for sugar and acid bodies approximately two hours after the operation and every two hours for the next forty-eight hours.

4. Blood sugar determinations should be made about three hours and again twelve and twenty-four hours after the operation, even though the urine is free from sugar. In that way early hypoglycemia can be determined. If acid bodies are found in the urine, a carbon dioxide combining power determination should be made at this time.

5. The remaining glucose of the daily diet in the form of liquids (as determined previously) is to be administered in three equal amounts during the next twenty-four hours. If the patient is conscious and has no nausea and no vomiting, the carbohydrates may be given by mouth. Otherwise necessary food and fluids may be given intravenously, e.g., 5 per cent glucose in normal saline.

6. The amount of fluid and saline to be used depends upon the patient's general condition. If no acidosis is present, probably 3,000 c.c. will be sufficient, but if acidosis does develop it may be necessary to give as high as 5,000 c.c. to 8,000 c.c. (Observation for pulmonary edema always should be made.)

7. Twenty-four hours after the operation, place the patient on a liquid diet which can be changed gradually to semi-solid and solid food during convalescence according to the surgeon's instructions. For abdominal operations (especially of the gastro-intestinal tract), this probably cannot be done so readily. Fluid by intravenous and subcutaneous routes may be used.

8. Blood sugar determinations and urinalyses should be continued each day until the patient is established on his previous amount of insulin and his pre-operative diet.

The above group is fairly easy to treat, and the patient's progress usually is uneventful from a diabetic standpoint.

The next group of diabetic patients, however, must be carefully observed. It is in these individuals we find our diabetic tragedies, and only by careful hourly observations can dangers be eliminated. At times the patient enters the hospital in acidosis or coma, and the problem at first is a medical one. An operation may be necessary, but the surgeon hesitates to operate until the acidosis is under control. As a rule the person in this classification usually has an acute condition which may demand surgery as soon as possible. The patient usually has a septic temperature. During the time the internist is attempting to control the acidosis, the surgeon must be finding the cause of the fever and attempting, if possible, to give any pre-operative care that is necessary. During this pre-operative period, blood sugar determinations, carbon dioxide combining power determinations, blood urea nitrogens, and blood chlorides, as well as hourly urinalyses and complete blood counts should be made. Many individuals with the diagnosis of diabetic coma are unconscious from some other cause at the time of admission to the hospital, and many cases of coma are sent to the hospital under other diagnoses. The most frequent error made in a diabetic patient is to accept a diagnosis of an acute abdominal condition because of fever, nausea and vomiting, and localized abdominal pain and rigidity. These individuals may even be found to have a high white count. At times it is a problem to decide if the patient has diabetic coma with appendicitis. We all have seen individuals a few hours after operation who were operated on with two little scientific data. In turn it is not uncommon for the surgeon and the internist to meet over this type of abdominal condition. It is only after all available data can be obtained that the proper treatment can be instituted. Whatever diagnosis is made, the acidosis and coma must be treated first, and if the internist can be given a few hours the final results will be more encouraging. Whatever the cause of the acute condition, the diabetic must be treated first for acidosis. These patients often are dehydrated and in shock, and means must be taken toward clearing up the acidosis. This in turn will combat the state of shock the patient may have from his acute infection.

Only after the first urinalysis and the above blood studies have been made should insulin be used. Remember even though the patient has been known to be using protamine zinc insulin in the past, regular insulin should be used at this time in order to more rapidly relieve the acidosis. The treatment of diabetic coma is, first, to combat the dehydration, and, second, to treat the acidosis. At this time we may not be able to eliminate the glycosuria before the patient is to be taken to the operating room. However, glycosuria itself is never the cause of death in these individuals, but the amount of acidosis and shock are in direct proportion to our mortality.

In the treatment of coma the immediate need is fluid and sodium. Insulin does not exhibit its complete effect until body fluid has been restored. The treatment should be as follows:

1. The patient should have absolute rest in bed. It is advisable to have a special nurse.
2. The patient's body warmth should be maintained with blankets and hot water bottles.
3. Catheterization of the bladder probably will be necessary especially if the patient is unconscious and cannot cooperate. In this case a retention catheter should be inserted. This is not advised by all clinics, and there is some question as to whether or not it is a logical step. At the University of Minnesota Hospitals we have found that it gives us a great deal more information about the patient during the time he is unconscious and when the urine needs to be examined more frequently. The urine should be examined for diacetic acid and sugar every one-half to one hour depending upon the severity of the case.
4. Lavage of the stomach may be necessary. At times sodium bicarbonate solution may be used.
5. The lower bowel should be cleansed with an enema.
6. Fluids should be administered through all avenues. Normal saline should be given by proctoclysis and hypodermoclysis. Today sodium bicarbonate still is used in the treatment, but it should never be used subcutaneously because of the possibility of sloughing of tissue. The fluid intake and output should be measured and recorded. The fluid intake should be between 5,000 c.c. to 8,000 c.c. in twenty-four hours. Care should be taken that the patient does not develop pulmonary edema. The chest should be auscultated at intervals to determine whether this is occurring. Extrarenal uremia, which will be mentioned under prognosis, occurs as a severe complication of coma. This is due to severe dehydration, which may effect the kidneys so adversely that anuria persists even after adequate fluids have been given. Hypertonic saline or glucose may aid in reestablishing the flow of urine. After the patient has developed consciousness, fluids may be forced by mouth. Clear broth with a liberal amount of salt may be given—also tea, coffee, and water.

7. Glucose should be given in some form by mouth if the patient is conscious; if the patient is unconscious it should be given intravenously or by rectum. Generally 5 per cent glucose in normal saline is used. Hypodermoclysis of glucose is not advised in the treatment of diabetics because of the danger of infection.

8. The use of insulin depends upon the presence and the amount of glucose in the urine. A suggested routine in cases of mild acidosis is to give 40 units of insulin at once, and to follow the urine every hour as long as it is positive for sugar. Forty units can be repeated hourly as long as the reaction is four plus. Usually at the end of two to four hours the amount of insulin must be reduced to possibly 30 units, then 20 and then 10, depending upon whether the test is three plus to two plus (yellow-orange) or one plus to a trace (green). Usually one administers 100 grams of glucose intravenously (in saline solution) for every 100 units of insulin used. This is unnecessary at the outset of treatment in most cases, but it should be begun as soon as the blood sugar has come down below 0.30 per cent or before the urine sugar has become small in amount or negative. This particularly is true when ketone bodies still are present in the urine. In severe acidosis the urine should be examined every one-half to one hour for diacetic acid and glucose depending upon the length of the coma, the height of the blood sugar, and the Van Slyke determination. Usually it is necessary to allow a retention catheter to remain in place until plenty of fluids have been given and the patient has become conscious and cooperative. Another method of using insulin in acidosis is to give 1 unit of regular insulin per kilogram body weight for the first dose, following the urine every half hour until reduction with Benedict's solution is green or until the blood sugar has reached 0.20 per cent. The treatment should be continued until the acidosis has disappeared.

9. Ephedrine or adrenalin should be given for stimulation. Blood transfusion may be of aid if the degree of shock appears to be critical.

10. Alkalies should be administered. Sodium chloride is much needed in acidosis due to dehydration and vomiting. The large amounts of fluid which are given, as mentioned above, serve to reduce acidosis by eliminating ketone bodies. In order to combat the acidosis more directly, sodium bicarbonate or sodium lactate may be given intravenously. It is advisable to give 25 grams of pure sodium bicarbonate solution in 500 c.c. of distilled water allowing one-half hour for this procedure. The bicarbonate is not sterilized, but it is simply dissolved in sterile distilled water. The molar sodium R-lactate solution, which was introduced by Hartmann and bears his name, generally is used intravenously, but it can be used subcutaneously or intraperitoneally if necessary.

The prognosis of this type of case depends upon the blood findings. After reviewing the laboratory methods mentioned above, we can give,

more or less, a prognosis with the following information in mind:

1. A blood glucose of 500 mgs. per 100 c.c. of blood or higher offers a serious prognosis. The higher the blood sugar climbs, the more grave is the prognosis.

2. A Van Slyke (or CO_2 combining power of plasma) below 30 volumes per cent is of serious significance; if it is below 20, it is in a very dangerous zone.

3. A urea nitrogen which is definitely increased is of dangerous significance. High urea nitrogens are accompanied by lowered blood chlorides. These are the result of dehydration, nausea, and vomiting, and are spoken of as extra renal factors in the production of uremia. Marked hemoconcentration occurs, which is one of the most important actual causes of death. In addition the venous and arterial pressures fall. The patient may go into shock, and with this there may be anuria or marked oliguria. In other words, the lesion is not in the kidney.

4. A high leukocyte count and abdominal pain (many times suggesting the diagnosis of appendicitis), also, are serious factors. A leukocyte count of 25,000 to 50,000 is not infrequent in diabetic coma.

5. A patient in acidosis and coma with any of the high figures mentioned above and having fever is critically ill and a favorable prognosis must be withheld.

The choice of anesthesia, although not directly under the medical management, is of great im-

portance. It must be emphasized that among the general anesthetics, nitrous oxide and ethylene frequently are used. Cyclopropane has been used successfully, but ether is more or less disapproved except for narcosis of short duration. Nitrous oxide and oxygen are unsatisfactory for extensive abdominal operations because they give no adequate relaxation. Therefore, ether must be used in certain periods during anesthesia. Spinal anesthesia can be used in operations on the lower extremities and perineum.

In conclusion I want to emphasize the necessity of carefully observing the urine and blood sugar during the post-operative period. When the patient is unconscious and perspiring, it must be remembered that this may be due to hypoglycemia. Convulsions do not always occur in this stage. The alert physician will never be misinformed during this period if he relies entirely on the blood sugar studies. If the urine is not watched carefully, the patient may be treated for coma when he really should not receive any more insulin. This is true especially if protamine insulin is used. Remember the most prominent symptoms of protamine hypoglycemia are nausea, vomiting, headache, and dizziness.

PRE-OPERATIVE CARE IN SURGERY OF THE BILIARY TRACT

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LORD Berkley Moynihan often emphasized the fact that the most important person at any operative procedure is the patient. I am certain that this sentiment is reflected in the marked decrease in mortality and morbidity in some of the more serious surgical problems now treated so much more satisfactorily. There is also no doubt that the increasing amount of care and thought now given the preparation of surgical patients plays a major role in the achievement of more satisfactory results.

Cutting points out the three-fold aim of pre-operative care:

1. The establishment of a full and complete pre-operative diagnosis.

2. The minimizing of the risk incident to the contemplated procedure as such, especially by attention to the stabilization of metabolism, selec-

tion of the optimum time or operation, and the correction of such associated morbid conditions as are amenable to medical or minor surgical therapy.

3. The prophylactic treatment of postoperative complications.

When considering an elective operation, adequate time may be used in proper pre-operative preparation, but in the acute cases, one must carry out this preparation rapidly, and administer surgical aid despite possible complicating conditions.

I wish to mention a few things requiring attention in the preparation of a patient for any elective surgical procedure. Oral sepsis is frequently present, and no patient should be allowed to undergo an elective operation until this condition is carefully treated by thorough brushing

of the teeth and the use of a suitable mouthwash.

Mild respiratory infections are frequently the forerunners of severe postoperative complications, and when one such is present, the operation should be postponed until all signs of infection have disappeared.

The overweight patient is nearly always a bad surgical risk, and in an elective case should be placed on a reducing regime before being subjected to an operation. The risk in such cases is great because they often present technical difficulties and are more subject to cardiac and pulmonary complications.

In the aged, elective surgery should be undertaken only after careful balancing of the maximum possible benefit against the operative risk. Mason states that surgery which in younger persons is definitely necessary may prove only meddlesome in the aged. The pre-operative examination in the aged patient may show the various systems functioning efficiently enough, but doing so under low reserve, and the added burden of a surgical procedure is often enough to upset the balance, resulting in cardiac or renal failure. It is, therefore, necessary in the aged patient to be very careful to obtain as accurate an evaluation as possible regarding the renal and cardiac functions when considering any major surgical procedure.

Coronary disease may present a clinical picture very similar to that of gallbladder disturbance, and when this is suggested, a careful differentiation should be attempted. It may be possible to rule out one or the other, but not infrequently both conditions are present. The surgeon may thus have to perform a surgical operation in spite of the combined pathological change, but he is well guarded in his prognosis if he is cognizant of the exact problem with which he is confronted.

Close co-operation between the medical and surgical services should be carried out at all times in dealing with bad risk surgical cases. When gallbladder disease is complicated by jaundice, renal impairment is frequently encountered, calling for careful medical treatment before any major surgical procedure is attempted. This practice also applies when there is an accompanying diabetes, and because of pre-operative and postoperative supervision that is now given, the diabetic patient undergoes operations very well.

The choice of anesthetic is of great importance, particularly when one is dealing with a poor

risk. The many valuable additions and refinements in anesthesia produced in the past few years have been a great aid to the surgeon. It is very comforting to have a trained anesthetist with whom the surgeon may consult and plan the anesthesia as carefully as he plans the operation. There can be no doubt that the improved mortality figures in the more serious surgical procedures is due to improvement in anesthesia, as well as better co-operation between the anesthetist and the surgeon.

In surgery of the biliary tract, we may encounter acute and chronic conditions of the gallbladder with various complications. In every case of biliary disease there is more or less hepatic damage, and in the more severe cases it is frequently accompanied by dehydration. When jaundice is present, there is also a hemorrhagic tendency.

Recent work done at the New York Post-Graduate Hospital shows that the mortality in patients with acute cholecystitis is 15.6 per cent if operation is performed within six hours after admission. If the patient is given twenty-four hours of pre-operative preparation, the mortality is but 7.4 percent.

This emphasis dramatically the importance of thorough pre-operative preparation. It has been found that intravenous administration of five percent dextrose or glucose in normal saline solution affords a satisfactory means of supplying the needed carbohydrates to support hepatic damage, and the saline solution furnishes chlorides and fluids to overcome dehydration that may be present.

There are many surgeons who do not operate upon patients with acute cholecystitis unless the indications point to a rapid progression of the disease, suggesting a possible perforation. When this course is followed, more time is given for pre-operative preparation. The clinical course of the disease is carefully observed to determine the progress of the infection, and this is usually aided by repeated white blood counts. It has been our experience that the white cell count does not give a satisfactory indication as to the extent of the pathologic change present, and we are now relying more on the sedimentation rate for this information.

Usually cases of chronic cholecystitis presenting themselves for surgical care are in the class of patients known as "good surgical risks." How-

ever, one must bear in mind that these patients have some hepatic damage, and should be given a three to seven day pre-operative preparation. They should be given a diet high in carbohydrates and low in protein and fat, but of high caloric value. It is well to remember that cases of chronic cholecystitis having had previous attacks of acute cholecystitis may present a more serious problem and call for a more guarded prognosis.

When there is a history of gallbladder disease of long standing, there is a greater possibility of stones being present in the common duct, thus increasing the operative risk.

Jaundice accompanying either acute or chronic cholecystitis increases the morbidity and mortality rates nearly one hundred per cent. These factors must all be borne in mind when preparing a patient for such types of biliary surgery.

When jaundice is present, it is necessary to combat the hemorrhagic tendency so often present. It has been shown by several observers that the hemorrhagic tendency associated with obstructive jaundice is due to a lack of prothrombin in the blood plasma. The administration of vitamin K in addition to bile salts has been found to be most efficacious in dealing with this condition.

If the prothrombin clotting time is normal, two to six gelatin capsules each containing 200 mg. of alfalfa concentrate and one or two grams of animal bile salts, administered by mouth, is an adequate daily dose. When the prothrombin clotting time is prolonged, the dosage must be increased and continued until the prothrombin clotting time is normal. At the Ancker Hospital, we have been using Kagalin which is a synthetic vitamin K. Satisfactory results have been obtained with a dose of 2 mg. of Kagalin plus 5 grams of bile salts, four times a day.

It is often difficult to choose the advantageous

time to operate on a patient with jaundice, and it is not wise to depend on clinical grounds alone in deciding the course of the jaundice. The study of the serum bilirubin is a sensitive index to the degree and course of the jaundice, and should be depended upon rather than the appearance of the patient. If the jaundice is increasing, operation should be delayed until the patient becomes adjusted to the higher level. If it is stationary, the final decision must be made on the basis of the other clinical factors present. These patients are in the group of bad risks, and are the ones calling for all the support that can possibly be given before any surgical procedure is undertaken.

In this way, the postoperative complications will be fewer, and the mortality and morbidity rates will be kept at a reasonable low level.

It is our experience that blood transfusions are of great benefit in the pre-operative and postoperative case of patients subjected to biliary surgery. Oftentimes, it is well to give the blood pre-operatively and to have additional blood available for immediate administration should the necessity arise.

I again wish to emphasize the fact that close co-operation between the medical and surgical services is imperative in dealing with the more severe types of cases that are encountered in biliary surgery, and also to repeat Sir Berkley Moy-nihan's saying that the most important person at any operative procedure is the patient himself.

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PORTAL OF ENTRY IN TUBERCULOSIS

A consideration of the portal of entry in tuberculosis brings out the following points: (1) Although alimentary infection is less common than respiratory, it is by no means a negligible factor, especially in children, quite apart from milk-borne disease; (2) in respiratory transmission, the sleeping accommodation is probably the most important single factor; (3) apart from the dust hazard industries, we still know very little about the risks of infection outside the home; (4) both alimentary and respiratory mass infections probably occur in the presence of the advanced case.—S. ROODHOUSE GLOYNE, M.D., *Tubercle*, Feb., 1940.

DIAGNOSIS OF TUMORS OF THE BREAST*

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A CONVENIENT approach to the diagnosis of tumors of the breast is a consideration of the clinical features of the individual case. These are shown schematically in the following outlines:

I. Single Tumor

1. Adherent: Scirrhus carcinoma—95 per cent; fat necrosis; mastitis.
2. Non-adherent: Deeply-placed scirrhus; medullary or gelatinous; cystic disease; fibro-adenoma.

1. *Adherent Tumors.*—In the case of a single tumor in the breast the most important observation to make is whether or not it is adherent to the skin or deep fascia. The great majority of adherent tumors are malignant, but in rare instances an adherent growth proves to be fat necrosis or mastitis. Palpable axillary lymph-nodes strengthen the diagnosis of malignancy. Unless the diagnosis is obvious one should remove the lump and examine it before proceeding with the radical operation.

2. *Non-adherent Tumors.*—When a tumor is definitely not adherent there is an even chance that it is benign; in young women the majority are benign, in older women most of these are malignant. It is to be remembered that carcinoma is quite rare before the age of twenty-five years and very rare before the twentieth year. Deeply placed scirrhus carcinomas are not adherent and medullary carcinomas, having no fibrous tissue, do not adhere. Tumors that are unusually movable are apt to be fibro-adenomas. Cystic disease frequently appears as a single non-adherent tumor.

In this group it is imperative that the tumor be removed and examined before the operation is decided upon. An aspiration biopsy may be made if one is reasonably sure the growth is a cyst.

II. Multiple Tumors

Multiple tumors in one or both breasts are malignant when adherent and nearly always benign when non-adherent. A carcinoma that has spread through the breast assumes the form of multiple adherent masses. In rare instances a

medullary or gelatinous carcinoma appears as non-adherent masses.

Non-adherent multiple tumors usually represent cystic disease, but rarely they may be fibro-adenomas. It is usually satisfactory to remove the most conspicuous mass for microscopic examination. If cystic disease is found no further operation is indicated.

III. Single or Multiple Ill-Defined Non-Adherent Masses

These usually represent uneven involution of the breast. After repeated pregnancies some lobules do not regress as much as others. Varying proportions of fibrous tissue in different parts may also give the impression of tumors. A clinical diagnosis can usually be made and operation is seldom indicated.

IV. Acute Carcinoma

This is a highly malignant carcinoma which produces diffuse induration of the breast with adhesion to the skin. The appearances are those of an acute inflammation. There is redness, tenderness and local heat and the patient may have a low fever. This is an incurable tumor and a better palliative result is obtained by radiation.

V. Mastitis

1. *Mastitis of Puberty.*—In either boys or girls near puberty there may develop a tender indurated area in the breast. The mass is small and circular and the nipple is in its center. This is a mild self-limited process and requires only local protective treatment.

2. *Exudative Mastitis.*—These are inflammatory lesions that develop usually during lactation or pregnancy. They exhibit the characteristic features of inflammation and are treated accordingly.

3. *Chronic Fibrous Mastitis.*—Masses of fibrous tissue sometimes develop in the breast. They may have a patchy distribution or the entire breast may be converted into a firm mass. It is called fibrous mastitis but there are really no evidences of true inflammation.

*Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

In the male breast the most frequent cause of a mass is chronic fibrous mastitis. It often develops in young men.

VI. Discharge from the Nipple

1. *With a Palpable Tumor.*—Whenever a palpable tumor is found it should be removed and examined. It may prove to be a papilloma or a carcinoma.

2. *Without a Palpable Tumor.*—In these cases the discharge may be bloody or serous. When the breast is removed a small duct papilloma may be found but more often there is merely a cyst com-

municating with a large duct. There is a sharp difference of opinion as to the proper treatment of this group. I have followed several patients with a serous discharge for some years, one as long as twelve years. Malignancy has not developed.

In the diagnosis of cystic disease of the breast it is important to distinguish the adenomatous type from carcinoma. If one examines sections of the breast under low magnification benign lesions always show a definite lobulation. Under high magnification these adenomatous areas appear malignant. Adenocystic disease is neither a cancer nor a precancerous lesion.

TREATMENT OF CARCINOMA OF THE BREAST*

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CARCINOMA of the breast because of its location and, as a rule, its early discovery, should be one of the most satisfactory malignant conditions that the surgeon is called upon to treat. But confusion has arisen in the minds of medical men as to the advice to be given a patient after cancer of the breast has been diagnosed because of the great variety of opinions regarding this subject which have appeared during the past few years. Treatment of carcinoma of the breast as elsewhere in the body predicates if possible the removal or destruction of all the cancer cells.

As in the treatment of any disease, the most important point is of course the diagnosis. All physicians are more or less familiar with the cardinal signs of malignancy, and after such a condition has been diagnosed the physician must determine the best method of attack, the one which will give the greatest promise of cure to the patient. Three methods are at our disposal when we plan such an attack: radical surgery, the use of deep x-ray therapy, and radium. The first question in the surgeon's mind is, can the lesion be treated surgically or is it obviously inoperable due to marked extension of the growth. Marked extension makes operation impractical because there is no doubt that it, in an inoper-

able situation, causes much greater harm than good.

Some years ago, Handley laid down a group of contra-indications for the operation of malignancy of the breast, and these contra-indications hold true to a great extent at the present time. Handley's contra-indications were: (1) if the primary growth has become attached to the bony thorax; (2) in the presence of subcutaneous nodules or skin infiltration situated more than two inches from the primary growth known as cancer en-cuirasse; (3) if there is a fixed growth in the axilla adherent to the thoracic wall; (4) if there is a marked edema of the arm; (5) if the supraclavicular glands are enlarged and fixed; (6) if there is evidence of visceral or bone metastases; (7) in the presence of some incurable constitutional disease, such as diabetes or tuberculosis, which is likely to be fatal in a few years; and (8) in the acute fulminating type of carcinoma.

Most of these contra-indications to operation can of course be recognized clinically and through the use of x-rays, and it is often surprising what an x-ray study will show in the presence of what appears to be a perfectly operable lesion. A case in mind demonstrates this.

A woman, aged fifty-two, with a small tumor located in the upper and outer quadrant of the left breast, which she stated had been present for about four

*Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

months, presented herself for examination. Palpation convinced us that the tumor, which was about the size of a small walnut, was malignant, and as has been our routine practice before operation is advised, a roentgenogram of the chest, and this revealed no evidence of metastases, so a radical operation was performed two days later. At that time, the growth was found to be a small scirrhous carcinoma with no evidence of glandular involvement in the axilla. Three weeks after the operation, she complained of severe pain in the back, and an x-ray study revealed the dorsal vertebrae to be studded with metastatic lesions.

As a result of this experience, our patients now have a film of the spine as well as a flat plate of the chest prior to operation.

Statistics vary a great deal in regard to the so-called cure of carcinoma of the breast by operative procedure because of certain definite factors. Following Handley's advice, some surgeons do not consider a lesion operable where nodes can be palpated in the axilla, while other surgeons attempt to operate upon these patients more or less routinely. The percentage of operative cure in this group will be somewhat lessened. It has been our policy, despite the fact that nodules can be palpated in the axilla, to advise operative interference, because very often the palpable nodules are not malignant but rather the result of some inflammatory change. It is the grade of malignancy or another as yet undetermined factor, which causes some tumors to metastasize a great deal sooner than others. Each of us has had experience illustrating this fact, and I wish to cite two rather striking cases in point.

The first is that of a woman, who at the present time is seventy-two years of age. I saw her first in 1926 because of a fractured arm. She was in the hospital for the fracture, and the interne in his routine examination discovered a tumor in her right breast. Examination of the tumor, at that time, revealed it to be about 2 centimeters in diameter, hard, and fixed to the skin. She said she had noticed it for about fourteen months. The tumor was obviously carcinoma. However, despite our urging, all forms of treatment were refused. I have had the opportunity to observe this growth up to the present time. It has been growing slowly and is now about the size of a baseball, fixed not only to the skin but to the underlying structures, evidencing, however, no axillary, supraclavicular, lung, or skeletal metastases.

The second case is that of a woman, aged forty-two, who, having two sisters with carcinoma of the breast, was naturally apprehensive and made a point of having her breasts examined at periodic intervals. She reported to us for examination in November, 1939, stat-

ing that she had noticed a small lump on the lateral side of the left breast, which to the best of her knowledge, had been present for about two weeks. The tumor was hard, appearing to be about 2 centimeters in diameter and fixed to the skin—clinically, a malignant tumor. After radiographs of the chest and spine had been found negative, radical interference was advised. We operated two days later, and despite the fact that no glands could be palpated in the axilla, numerous metastatic nodules were found in this location at the time of operation.

History of Operative Procedures

It is interesting at this time to review briefly the methods of handling breast cancers, and the steps leading up to our present radical operation. As near as I can determine, it was the Flemish surgeon Vesalius⁷ who, in 1562, reported two cases of carcinoma of the breast, with operation, although he did not publish just what type of procedure he had used. In the diary of Rev. John Ward, Vicar of Stratford-on-Avon, we find a notation that a Dr. Edwards, in the year 1650, operated upon a woman for a cancerous growth in the breast. Naturally, the entry gave no technical description of the operation. Heister,¹¹ in his book on surgery published in 1753, gives some detail as to the method of treating malignant conditions of the breast, and it is interesting to note that Heister lays some stress on the uselessness of the operation when axillary glands are involved and the growth is fixed to the underlying tissues. However, he does qualify the opinion by stating that not all axillary glands which may be palpated in a case of cancer of the breast are malignant. Heister's method of removing the breast for this condition was to use a large pair of pliers, sometimes called the *Tenaculum of Helvetius*, which completely encircled the breast, raising it upwards to make the operative procedure easier and at the same time, to aid in the control of hemorrhage. It is further interesting to note,⁶ that a number of the foremost surgeons following Heister, such as Gross, Agnew and Sands, were very much discouraged in the handling of malignant breast lesions, and were quite frank about never having cured a case. Agnew, especially, stated that in later years he operated upon this condition solely for the moral effect upon the patient.⁶

It was Volkmann's observations⁶ and reports published in 1875, that really marked the beginning of a scientific operative approach to cancer of the breast. His main contribution was the in-

formation that the fascia covering the pectoralis major should always be removed, since it had been clearly demonstrated that carcinomatous cells often permeate this fascia. Kuester, in 1883, and his assistant Heidenhain in particular, advanced the theory, that not only the fascia should be excised, but also some of the fibres from the pectoralis major muscle.⁶ It is also to Kuester's credit that the first thorough dissection of the axilla was made, although Volkman had suggested this procedure some years before. It was in 1882 when Halsted, as a result of following the lead given him by European surgeons and reported observations of various pathologists, removed the entire pectoralis major muscle (the reason again being obvious), that he discovered the new growth permeating or extending into the muscle itself. It is also interesting to note that Halsted early advocated the desirability of dissecting the supraclavicular fossa, but after a short trial period, he apparently arrived at the conclusion that this procedure was not satisfactory.

Willy Meyer,¹³ in 1894, went a step further by advising the removal of the pectoralis minor muscle, and nineteen years later, Handley advocated the inclusion of the upper portion of the sheath of both recti muscles. All of these steps of course have been logical, and of untold advantage to the patient, as is witnessed by Halsted's report⁶ on his first fifty cases wherein the local metastases or recurrences were decreased to 6 per cent. In previous reported series, the recurrences ran from 55 to even 80 per cent, so it would seem to me that any surgeon, who fails to perform a radical operation, that is, the removal of both pectoral muscles, and as complete a dissection of the axilla as is possible, in addition to the removal of the breast (providing the case falls in the group that is considered clinically operable) is not even giving the patient a "sporting chance" for a fair recovery.

Technic

In performing a radical operation for malignant lesions of the breast, practically all experienced surgeons agree that a large amount of skin surrounding the tumor should be excised. All the newer types of incisions which have been described are a distinct aid to the individual operator. Nevertheless, they are all modifications, practically speaking, of the type of incision de-

scribed by Meyer and Halsted in their original articles. I believe with Harrington, that the surgeon should not always use the same type of incision, when doing this operation, but that he should plan and execute his incision according to the location of the lesion. It is my belief that sharp dissection should be resorted to in doing the entire operation, and as described by Halsted⁶ in his original article, the axilla should be thoroughly dissected before the breast and muscles are removed. The reason is obvious, in that by doing the axilla first, the hazard of spreading any loose cells which may be present is lessened. Despite the opinion of some surgeons, that the cutting and removal of the external respiratory nerve of Bell or the long subscapular nerve is inconsequential, it has always been my policy to carefully preserve these nerves in every case. Hemorrhage, of course, must be carefully controlled. Adequate drainage must be provided, when closure is attempted, but the drains should be removed within forty-eight hours. If there is any difficulty encountered in the closure of the wound, we believe that undue stress of the sutures should be carefully avoided, or rather that the wound be left open, and skin grafting later resorted to. Application of Thiersch grafts has been the most ideal procedure in our hands.

Directly after the patient is returned to her bed, it has always been our policy to extend the arm well above the head, and hold it in such a position for at least forty-eight hours, at which time the nurse should be instructed to begin movement of the extremity. The use of this procedure, we believe, has been of great benefit to the patient in the early improvement of function. In the event of local recurrences our method of treatment is to use the actual cautery, and, as in the original procedure, to burn well around the involved area.

X-ray and Radium

In attempting to evaluate radiation therapy for carcinoma of the breast, one finds that the views of various men with a great deal of experience in this field are quite divergent, and no one technic is universally practiced. It is not within my scope to determine what is the correct dosage, whether or not treatment should be administered through an aluminum filter, or what amount of therapy is really adequate. It is after studying the papers written on this subject by

a goodly number of men interested in this particular line of treatment, and the procedures practiced in various institutions that I base my opinion. It seems to be quite the consensus of opinion, that the use of the x-ray is of considerably more value than radium in its various forms, although Levin¹² believes that radium has a very definite place in the treatment of carcinoma of the breast. Adair¹⁵ has used it somewhat as an adjunct, while Keynes¹⁵ of London is the only person who maintains that the treatment of carcinoma of the breast should be limited to radium. The status of x-ray therapy in the management of carcinoma of the breast, that is, whether it should be used preoperatively or postoperatively or both or whether treatment should be limited to x-ray radiation is an important question and, I believe, a debatable one. Men of experience all agree that the so-called inoperable carcinoma of the breast should be placed immediately in the hands of the roentgenologist.

These cases are, of course, quite desperate in character, and naturally the percentage of cures is small. When carcinoma of the breast is operable, few recommend x-ray therapy alone. Pre-operative x-ray therapy may or may not have been given a fair trial, because physicians generally believe that the time which would elapse before operation, in giving such therapy, would be more harmful than the anticipated gain from radiation. Adair advocates a three-month period between the termination of x-ray therapy and operation. Furthermore, section of the new growth will correct the error in diagnosis which is likely to befall any surgeon, and, in addition to saving the patient the ordeal of a radical mastectomy, may also obviate unnecessary x-ray therapy. In most clinics, however, operation is followed by deep x-ray therapy, on the assumption, of course, that all cancer cells may not have been removed. Neither pre-operative nor post-operative x-ray therapy has been given in any operated cases of breast cancer at the Ancker Hospital in Saint Paul. However, at the present time, it is not possible for us to give the percentage of cures in these cases. In my own private series, however, I have never had a case in which I have advised pre-operative x-ray therapy, and only about 60 per cent have been given x-ray treatments postoperatively. Statistics do vary as to the evaluation given to x-ray therapy before

or after operation but it is probably the consensus of opinion that radiation increases five-year cures from 4 to 11 per cent.

It is pertinent, I believe, to say a few words regarding the complications which may arise during and following x-ray treatments. The most immediate effect is nausea and vomiting which occur during the interim between treatments. We have found that the administering of Vitamin B for about a week before the treatments are given and a continuation of this medication during the treatment alleviates to a great extent the nausea and vomiting which occur in a relatively high percentage of individuals. The second distressing complication is the persistent cough which, it has been thought, is due to a pneumonitis developing as a result of the treatment and usually appears sometime after the treatments have been terminated. In our group of cases, various cough preparations have been given, but we have discovered that the administration of a quarter of a grain of codeine sulphate at stated intervals is perhaps the most efficacious manner of controlling this symptom. Fortunately, this cough will usually disappear in from six to eight weeks.

Lastly, when the individual has been given sterilizing doses of rays, a great percentage will naturally present the various symptoms so common to the menopause. Theelin or some of its related extracts have proven excellent in relieving these distressing symptoms.

Beatson,³ a number of years ago, first suggested that the removal of the ovaries as a treatment of inoperable carcinoma was indicated on the basis that the artificial menopause thus induced would excite evolutionary changes, not only in the normal epithelium of the breast but also in the cancer cells themselves. This method was also studied and advocated by Abbe, Lett, and Boyd. However, this procedure was practically discontinued until Torek¹⁶ reported eight cases of inoperable carcinoma, where oöphorectomy was done on the basis of "being unable at that time to do anything better." The influence of the ovary in the development of cancer of the breast has received intensive study, and the fact appears to be well-established that cancer of the breast is considerably more malignant in the young woman, as is witnessed in Davis'¹⁵ report of no cures in cases of carcinoma of the breast in women under thirty. This is verified by de

Lee, who states that in a series of patients under forty years of age, only 27 per cent are alive and well at the end of five years, while in the group of patients over forty years of age, forty-five per cent are alive and well at the end of the same period of years. It further appears to be unanimously agreed that pregnancy is a serious complication in the patient who has cancer of the breast. In Trout's series of cases, in which pregnancy occurred after operation, 87 per cent developed carcinoma in the remaining breast. Numerous authors, with Pfahler¹⁵ in particular, cite startling statistics to prove that either surgical sterilization or sterilization by the use of the x-ray has produced marked benefit in recurrent or metastatic cancer of the breast. Harrington's belief¹⁰ that 75 per cent of the operable cases have remnants of the disease after radical operation, would suggest routine employment of ovarian sterilization to avoid estrogenic influence on the cancer remnants. It has recently been Carroll's opportunity to have seen and studied a case of metastatic carcinoma, arising from the breast and causing a pathologic fracture in the right femur.⁴ X-ray therapy was resorted to, and the patient was given sterilizing doses immediately following the fracture. It was surprising to note the rapid healing that occurred, and the apparent regression of the lesion, so that the patient after two years is able to get around in a very able manner. It would therefore appear that either pre-operative or postoperative ovarian sterilization is justified, on the basis of preventing further pregnancies, and in avoiding the deleterious stimulative influence of ovarian internal secretion, associated with the menstrual function, and that the use of the x-ray seems to be the method of choice after such a procedure has been decided upon.

Arguments have been advanced pro and con, as to the desirability of doing a biopsy, which is a more or less routine procedure in the hands of many men, the anti's taking the position that in the removal of a tumor for micro-examination, there is great danger of dissemination of some of the cancer cells. This group are also strong advocates of the theory that breast tumors should not be repeatedly examined, and that the utmost gentleness must be employed in palpating these lesions for the same reason. While we have no direct proof as to the damage palpation may cause, it has always nevertheless been hard for

me to believe that one may disseminate malignant cells in such a manner; and I am just as firmly convinced, that when a surgeon removes a growth for microscopic examination, he should be prepared to immediately proceed with a radical operation, should the tumor be found malignant. The reason for this is of course that if part of the malignant process be accidentally spread by the biopsy, the removal of the entire breast within a few minutes will remove these cells. Fortunately for the patient, I believe a biopsy is rarely necessary. In other words, the benignity or malignancy of breast tumors may be determined in a high percentage of instances by clinical examination alone.

Conclusion

The most important consideration in the treatment of carcinoma of the breast is the early diagnosis. Radiographs of the chest and spine should always be taken before any surgical procedure is attempted. While operative removal is contra-indicated in certain advanced lesions, this is by far the most valuable means we have for curing carcinoma of the breast. Bearing in mind that cosmetic considerations have no place in the treatment of cancer, wide excision should be practiced in every case. The value of pre-operative x-ray therapy is still more or less indicated, but there is definite evidence that postoperative x-ray therapy has a definite place in the treatment of this disease. Lastly, sterilization of the individual has undoubtedly proven sufficiently beneficial to warrant its performance in certain cases.

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PRIMARY CARCINOMA OF THE BRONCHUS*

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PRIMARY carcinoma of the bronchus has come to assume a place of increasing importance among pulmonary diseases and it is estimated at present that primary carcinoma of the bronchus constitutes approximately 10 per cent of all carcinomas that occur in the body. Its importance becomes more apparent when it is realized that out of approximately 150,000 people who die yearly in this country as a result of carcinoma, 15,000 die as a result of carcinoma of the bronchus.

Primary carcinoma of the bronchus is no respecter of age, and may occur at any period of life. As a rule, however, it is most likely to appear after middle age. It is more common among men than women; the proportion of men to women is approximately 3:1. One of the greatest obstacles in its early diagnosis is the fact that its onset is often insidious and its symptoms may closely resemble those produced by other forms of pulmonary disease.

The symptoms produced by primary carcinoma of the bronchus depend mainly on the situation of the tumor and the degree of bronchial obstruction it produces. When the tumor first develops in the lumen of the bronchus, it is usually so small that it produces no symptoms of obstruction. It does, however, cause irritation of the bronchial mucous membrane which manifests itself in a dry, nonproductive cough. This is usually the first, and is by far the most common, symptom of the disease. As the tumor increases in size, it interferes with normal drainage of the bronchial tree distal to the point of obstruction, and the normal secretions tend to accumulate in this portion of the lung. With time, the retained secre-

tion becomes infected, and as a consequence the sputum, which was at first mucoid, soon becomes purulent. Depending on the degree of obstruction and the virulence of the infecting organism, bronchitis, bronchiectasis, pulmonary abscess or gangrene of the lung may develop distal to the point of obstruction and may give rise to symptoms and findings that may obscure those of the primary lesion itself. The tumor, as it increases in size, undergoes ulceration and trauma, which give rise to bleeding and the appearance of blood in the sputum. The quantity of blood may vary from a small amount which produces blood-streaked sputum up to and including a massive pulmonary hemorrhage.

Further increase in size of the tumor brings about interference with air entering and leaving the lung distal to the point of obstruction, and as a result atelectasis soon develops. As a consequence of this development, the patient may have dyspnea, wheeze and a sense of discomfort over the thorax which is often out of proportion to the degree of involvement of the lung.

With the development of bronchial obstruction and interference with drainage of bronchial secretions, episodes of chills and fever may appear. Such episodes will occur in approximately 53 per cent of cases of primary carcinoma of the bronchus. During these episodes of chills and fever, there is usually an area of increased dullness over the portion of the involved lung, and the condition frequently is diagnosed erroneously as bronchopneumonia. This impression may be further substantiated by the fact that, after from three to five days the patient may suddenly expel the retained secretion with almost prompt subsidence of chills, fever and, frequently, cough. As a consequence, many patients are permitted to go on for variable lengths of time, and only when

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there is a recurrence of such an episode is the true nature of the underlying pathologic process determined.

Pain usually is not an early manifestation of primary carcinoma of the bronchus. When present, it indicates either that secondary inflammatory reaction has taken place in the pleural cavity, or that the malignant process has extended to the thoracic cage. Pleural effusion, which occurs in approximately 10 per cent of cases of primary carcinoma of the bronchus, is likewise a bad prognostic sign and generally indicates an extension of the malignant process to the pleura. In a high percentage of cases of primary carcinoma of the bronchus loss of weight is noticeable, but this is not necessarily of prognostic value. On the other hand, hoarseness, which is noted less frequently, is invariably an indication of inoperability.

It must be pointed out that absence of symptoms does not exclude the possibility of primary carcinoma of the bronchus. In a study made some years ago, I found that in 3 per cent of cases there were no symptoms referable to the lung, and the condition was discovered on roentgenographic examination of the thorax during routine examination, or as a result of the development of some peculiar neurologic lesion for which the neurologist referred the patient for special examination to rule out the possibility of bronchiogenic carcinoma.

Although the symptoms which have been described are more or less characteristic in most cases of bronchiogenic carcinoma, there is one group in which the lesion, because of its peculiar situation, gives rise to an entirely different train of symptoms. In this group the carcinoma originates in the extreme apex of the lung, and Pancoast, who first described it, gave it the name of "superior sulcus tumor." Because of its location in the apex of the lung, this type of tumor tends to spread rapidly and impinge on the neighboring structures; it thus gives rise to characteristic symptoms. The earliest symptom usually is pain around the tip of the shoulder and about the shoulder girdle. Because of lack of pulmonary symptoms, the condition is often thought to be neuritis, and the majority of patients have their tonsils or teeth removed in the hope of obtaining relief of their so-called neuritic pain. The pain tends to spread down the arm to the fingers, and

definite muscular weakness soon follows. As the tumor increases in size, it also impinges on the sympathetic chain and Horner's syndrome soon develops on the homolateral side.

The physical findings in primary carcinoma of the bronchus are dependent on the stage of development of the tumor and on its location. When the tumor first develops, there are practically no physical indications. As it increases in size and produces bronchial obstruction, if the part involved is near the surface of the lung, increased dullness may be found over this area. By far the most valuable and important finding is that of suppression of breath sounds. Whenever this finding is elicited in the course of physical examination, the possibility of primary carcinoma of the bronchus must always be considered, and the patient should have the benefit of bronchoscopic examination.

A careful search should be made for metastasis in every case, because carcinoma of the bronchus tends to metastasize early in the course of its development and to spread widely throughout the body. Metastatic nodes are found in approximately 20 per cent of all cases.

I shall not attempt to consider the roentgenographic findings in carcinoma of the bronchus, as they will be discussed by Dr. Weber. I do wish to point out, however, that in cases in which the clinical history is suggestive of primary carcinoma of the bronchus, or in the presence of bronchostenosis as elicited on physical examination, the possibility of carcinoma of the bronchus cannot be excluded even if the roentgenogram of the thorax does not present evidence of carcinoma. In such cases bronchoscopic examination should always be carried out.

Bronchoscopy has probably done more than any other procedure to awaken interest in the problem of primary carcinoma of the bronchus and is of the utmost importance in its diagnosis. It is of value not only because it permits the obtaining of tissue for microscopic examination, but also because it enables the examining physician to determine the situation and extent of the lesion and to judge its operability. In cases in which the lesion is associated with marked secondary pulmonary suppuration, as a result of obstruction and interference of drainage, the patient's general condition may be such that surgical interference would be inadvisable. By bronchoscopic

means, aspiration of the retained secretions can be carried out and the patient's general condition improved.

As might be anticipated, it is impossible to obtain satisfactory tissue for examination when the lesion is in the peripheral portions of the lung. Also, it is important to point out that in cases in which biopsy does not reveal carcinoma and in which a definite tumor mass is seen through the bronchoscope the diagnosis made from the biopsy cannot be accepted as final. The tissue may have been removed from the edge of the tumor, or from that portion of it which has undergone necrosis and the cellular structure is no longer discernible. So far as bronchoscopic examination itself is concerned, it can and should be carried out with a minimum of discomfort to the patient, and with practically no risk.

The differential diagnosis of primary carcinoma of the bronchus at times may be exceedingly difficult. The lesions that most closely simulate primary carcinoma of the bronchus are dermoid, neurofibroma, and foreign body in the bronchus, broncholith, lymphosarcoma and tuberculosis. The differential diagnosis when the results of bronchoscopic examination are negative is usually dependent on the roentgenographic findings.

Primary carcinoma of the bronchus originates from the bronchial mucous membrane and tends to develop into either a squamous-cell carcinoma or an adenocarcinoma. The diagnosis as to the character of the tumor is of the greatest importance in determining the type of treatment that is most suitable in a given case. In my experience, cases of squamous-cell carcinoma of the bronchus have been slightly more numerous than cases of adenocarcinoma. The majority of the malignant tumors of the bronchus are of an extremely high degree of malignancy.

There is one variety of bronchial tumor which grossly appears distinct from other bronchial carcinomas. This tumor is generally pedunculated and usually does not metastasize. Many pathologists regard such tumors as benign, and designate them as adenomas. Broders, Robertson and their associates, however, regard such tumors as adenocarcinomas of low degree of malignancy. It is my opinion that such tumors should be regarded as potentially, if not actually, malignant, and treated accordingly, for if no treatment is given, they will lead to the patient's death.

The treatment that is to be employed in any given case is dependent on the location, extent and character of the tumor, the presence or absence of metastasis, and the general condition of the patient. In my experience, if the tumor is of the adeno-carcinomatous type, is localized and polypoid in nature, and can be readily reached through the bronchoscope, it is best handled by destruction of the tumor by means of surgical diathermy and insertion of radon needles into the base of the tumor. This procedure can be employed with very little risk to the patient and with excellent postoperative results. All of the patients with this type of lesion whom I have treated by this method are still living and well.

If the tumor is extensive, or in such a position that it cannot be readily reached by bronchoscopic means, and if there is no evidence of metastasis, surgical extirpation should be considered. In carcinoma of the squamous-cell type without metastasis, if the patient's condition is satisfactory, pneumonectomy is the procedure of choice. If, on the other hand, the tumor has metastasized, or is placed so that it cannot be removed readily at operation, and if the patient's condition warrants it, roentgen therapy may be indicated. Although no cures are to be offered from this form of therapy, there is a prospect in approximately every sixth case of prolonging the life of the patient.

Summary and Conclusions

It may be stated, therefore, that primary carcinoma of the bronchus presents an ever increasing problem in the diagnosis and treatment of pulmonary disease. The possibility of its existence should be considered seriously in any case in which the patient gives a history of chronic cough, especially if the cough is associated with expectoration of blood. If progress is to be made in the successful management of this disease, the condition must be diagnosed in an early stage. Bronchoscopic examination should be employed whenever such a lesion is suspected. Satisfactory biopsies can be obtained in approximately 75 per cent of cases by this means. With earlier diagnosis, and with the improvements that have taken place in the fields of thoracic surgery and bronchoscopy, there is an increasing opportunity of affording relief to the unfortunate sufferers from primary carcinoma of the bronchus.

FRACTURE OF THE ELBOW

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BECAUSE of the complexity of the various phases of elbow fractures I should like to confine my remarks to fractures in and about the elbow occurring in childhood and early adolescence. I would like to point out the difficulties of diagnosis, outline different methods of reduction and immobilization, and finally discuss briefly the common complications that one may expect but must attempt to avoid or correct.

The first stumbling block in diagnosis may be the varying number of epiphyseal lines that are seen in the x-ray film at different age periods. These vary from none during the first year to as many as seven during the early 'teens. There is an excellent chart which has been published by Camp and Cilley that is of considerable aid. Another helpful procedure is to take a roentgenogram of the uninjured elbow. The line that may fool us most frequently is the one in the olecranon, which is visible over a relatively short age period.

After the diagnosis is established the question of treatment comes next. This, of course, varies with the type. Let us consider first the supracondylar. Prompt reduction is needed here pre-eminently. The longer the delay the greater the swelling, the more difficult the replacement and the greater the likelihood of complications.

One can more readily appreciate this when he realizes that the lower fragment tears the periostium from the posterior margin of the shaft, thus opening a wide area of hemorrhage. The lower end of the proximal fragment at the same time slides forward and downward jeopardizing the vessels and nerves in the bend of the elbow.

When one comes to the actual manipulation it is perhaps trite to say that there must be complete anesthesia and relaxation of the injured area. This can be accomplished in the very young with ether. Older children can often be handled with local novocaine.

The first maneuver must be directed toward disimpacting the fragments, using extreme care to prevent any added injury to nerves or vessels

in the cubital space. The fingers are then used to drag the distal fragment downward. When one feels that the ends are clear the thumbs are placed on opposite sides of the anterior surface of the proximal fragment and a rotary pincer action begun. At the same time an assistant acutely flexes the forearm. I feel that this maneuver works better without strong traction on the forearm. The latter tends to clamp the lower fragment against the upper. Now one must make sure that the radial pulsation is palpable and adequate. If it isn't the flexion must be diminished to the point where the pulse can be felt. If the circulation is adequate and the reduction appears complete so that the fragments are apposed and the distal one angles forward about 40°, the arm should be immobilized in this position. This may be done with the Jones sling. I like to add to this as posterior moulded plaster splint to prevent rotation or loss of the carrying angle. Another excellent splint is the one recommended by Eliason.

Dunlop has reported excellent results from traction in bed with counter traction at right angles to the forearm traction. The former is to be applied above the elbow. The points claimed for this procedure are: less additional injury which manipulation may inflict; less danger of ischemic paralysis; and excellent position and function are possible.

If one is called to see a supracondylar type of fracture after repeated manipulations have already been done I feel that open reduction is often the most conservative way to treat it. The tissues should be allowed to rest several days before operating. As a rule internal fixation is not needed.

Fractures of the olecranon are not common in children. When present, open reduction with internal fixation is indicated.

Fractures of the medial epicondyle almost always result in non-union unless internal fixation is carried out. Injuries to the capitellum often result in fractures irreducible by closed methods. Rotation of the fragment is often present. Open reduction should be done and it is often neces-

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sary to remove the loose fragment as its blood supply may be gone.

Fractures that involve one or both condyles must be very accurately replaced or growth disturbance almost surely will ensue. If closed manipulation does not accomplish this, open reduction is called for. One should not hesitate to use a pin or nail even if it crosses the epiphyseal line.

We come now to the complications, one of which may be more serious than the bone injury. I refer now to ischemic paralysis. This is explained on a pressure basis but this pressure may occur without any splint being used. The fascial coverings of the flexor muscles of the forearm will not stretch as readily as the soft walled veins collapse. Therefore if elevation of the arm does not allow good circulation, these fascial sheaths must be opened to relieve the internal pressure.

The next complication to be mentioned is nerve injury. This may be immediate or appear later.

Usually unless there is actual tearing the nerve lesion will clear up after a few weeks.

Loss of carrying angle may be due to improper reduction or to epiphyseal growth disturbance on one side. The latter, of course, cannot be an immediate complication; when it is due to the former the reduction must be corrected.

In conclusion:

1. One must be able to differentiate a fracture from epiphyseal lines.
2. Early treatment is essential.
3. If gentle manipulation is not adequate, it may be safer to employ gradual traction and counter traction in bed, according to Dunlop, or resort to open reduction.
4. Certain types of elbow fracture call for open reduction.
5. The complications may be serious and call for prompt and radical intervention in the case of ischemia.

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HEMOPHILIA WITH INTESTINAL OBSTRUCTION

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THE clinical picture of acute intestinal obstruction occurring in hemophilia is fortunately rare. Because this condition constitutes such a grave emergency it seems worthwhile to record the findings and the method of therapy employed in such a case.

C. B., an eight-year-old male, was admitted to the hospital because of acute abdominal pain. Although there was no family history to suggest hemophilia in any of his antecedents traced carefully as far back as the early American Colonial period, the child's past history was considered characteristic of this condition. The first hemorrhagic manifestation had occurred at about ten days of age, consisting of prolonged and serious bleeding from the prepuce necessitating transfusion. Since that time there had been innumerable episodes of bleeding into the skin, muscles, and joints, and even occasional transient hematuria after apparently trivial accidents. The child had previously been observed and treated by Dr. Cannon Eley of Boston and Dr. Montgomery Blair of Washington. They concurred in the diagnosis of hemophilia. Practically all methods of therapy suggested in the literature during the past ten years had been employed at different periods, all with uniformly unsuccessful results in controlling the bleeding. Studies of the blood calcium and protein levels had always been normal, as had the total platelet

count. Bleeding time had been repeatedly normal or slightly elevated, while the coagulation time had varied from twenty minutes to several hours, and was rarely under thirty minutes.

One week previous to admission to the hospital the child developed an acute upper respiratory infection which was soon followed by rather severe bleeding into the right knee joint, the left elbow, and muscles of the left arm. Four hours prior to admission he complained of abdominal pain, which became progressively more severe and was soon followed by occasional vomiting. The significant physical findings were the typical chronic hemarthrotic joints, together with abdominal pain referred to the right lower quadrant. Tenderness in the region of McBurney's point was present. The leukocyte count was 11,300 per cu. mm. with 83 percent polymorphonuclear cells, and 17 percent lymphocytes. Temperature was 100.2°, pulse 86, respiration 22, clotting time of blood one hour and thirty-three minutes. The tentative diagnoses on admission were acute appendicitis, intestinal obstruction due to hemorrhage into the bowel wall, or possibly, intussusception.

The child was transfused at once. Four hours after this procedure he seemed more rather than less ill but the pain and tenderness had shifted to the mid-portion of the abdomen and had become more colicky in nature. Vomiting occurred again and visible peristalsis could be observed on the abdominal wall just preceding these

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colicky pains. There was a rather indefinite boggy mass just below the umbilicus, and loud borborygmi occurred over the upper abdomen only. No stool or flatus was passed. Radiographs were made of the abdomen (Fig. 1) and were reported as typical of obstruction in the small intestine in the right lower quadrant. There was



Fig. 1.

no increase in the leukocyte count, and because of the undoubted great risk involved in any surgical procedure, especially in the abdomen, it was decided to treat the obstruction symptomatically with nasal suction (Wangenstein¹) and supportive measures. The nasal tube was passed into the duodenum without difficulty, and fluids were administered by vein. Within an hour after the suction had been established, the child had relief of the abdominal pain and passed a quiet night without sedation. During the next day the tube was clamped off at intervals without recurrence of symptoms and after twenty-four hours it was removed. There was no hematemesis or melena and for this reason it was felt that the obstruction might have been due to a

hemorrhage into or near the bowel wall. The indefinite mass which had been palpated just below the umbilicus disappeared rapidly after the suction had been instituted and as the symptoms and signs of the obstruction abated. Four days after the suction had been discontinued there was a moderate hemorrhage from the nostril through which the tube had been passed which was readily controlled by transfusion. Aside from this there was no further bleeding and no further complaint referable to the abdomen.

It is not within the scope of this report to discuss the precautions necessary in hemophilia; suffice it to say that surgery should be avoided whenever this is at all possible, and that transfusion remains the most satisfactory agent to control the hemorrhagic manifestations. The well known fact that remarkable variations of clotting time of the blood occur in these patients when tested at frequent intervals renders even this determination of dubious value in choosing the time for operation. The case reported illustrates well the need for careful consideration of the surgical indications. Some might maintain that this case warranted surgical intervention although a review of the literature reveals that the prognosis in abdominal surgery is especially grave in hemophilia. The subsequent course of events certainly justified the conservative therapy employed and rendered the tentative diagnosis of intestinal obstruction due to a hemorrhage into or near the bowel wall as most tenable of those considered. Intussusception, segmental ileitis, appendicitis, mesenteric adenitis or thrombosis, Meckel's diverticulum and various causes of ileus were ruled out as far as possible. While no attempt is made here to minimize the dangers of delay in intestinal obstruction, the results, in this instance at least, served to emphasize the wisdom of a preliminary period of employment of conservative management when the acute condition is complicated by the presence of hemophilia.

Intestinal obstruction in hemophilia is a very rare condition, no similar instance having been reported in the past twelve years. The obstruction in the case here reported was probably due to the occurrence of hemorrhage into or near the bowel wall and there was a favorable outcome with non-surgical therapy.

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AMYOTROPHIC LATERAL SCLEROSIS WITH PSYCHOSIS (PARANOID TYPE)

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THIS case is reported because of its obvious interest. In going through the literature it was found that only a few cases of amyotrophic lateral sclerosis with psychosis have been reported recently. The use of new therapeutic agents, especially alpha-tocopherol, should stimulate study in this chronic disease.

This disease is characterized clinically by a lower

motor neuron paralysis of the upper extremities and an upper motor neuron paralysis of the lower extremities. It usually begins with atrophy, weakness and fibrillary tremors in the muscles of the arms, the atrophy being most pronounced and characteristic in the hands. The palmar fascia becomes rather prominent. This together with paralysis of the fingers in

the position of flexion causes the claw hands. Gradually signs of pyramidal tract involvement appear, giving the typical picture of spastic atrophic extremities with increased reflexes. As the disease progresses, bulbar symptoms appear, speech becomes dysarthric and swallowing difficult. Death is due either to bulbar involvement or to intercurrent infection.

Charcot is credited with having first described this disease in 1865. It then became known as Charcot's disease. Since that time much work has apparently been done but little is known of its etiology or its treatment.

Grinker, in his textbook of neurology, does not consider this a distinct disease entity, but rather classifies it with the muscular atrophies.

The disease usually begins in the third decade, affecting males three times more frequently than females. No mention was found in the American literature of its geographical distribution.

Etiology is unknown. More appears in the older literature concerning etiology. Lead and arteriosclerosis have been said to play a part. There may be a hereditary factor present for Moleen reported cases in three brothers. A congenital predisposition of certain nerve cells to undergo early atrophy has been suggested; in the sense of Gowers, this represents an abiotrophy. In common with modern trends, vitamin deficiency has been suggested.

Pathologically characteristic are the signs of degeneration without signs of inflammation involving the anterior horn cells of the cord and the large Betz cells of the cortex. This degenerative process usually begins in the anterior horn cells of the cord. The Betz cells first involved are those of the paracentral lobule where the leg fibers originate.

The depression which such an incapacitating disease should be expected to cause does not appear in all cases. The most frequently mentioned personality changes are irritability and recent memory loss. I. S. Wechsler and C. Davidson in a report of three cases stated that no pathologic changes were observed in the brain except degeneration of the large Betz cells. Other authors reported the same findings. Some even suggest that the lack of mental change is dependent upon the fact that the small cells of the cortex are not involved in the degenerative process.

In 1925 Von Bogart reviewed the literature and published his account of thirty-one cases. In 1930 Ziegler completely reviewed the literature and published this together with three case reports.

Since that time only a few more cases have been reported in English literature. Apparently no new conclusions have been made concerning the relationship between neuropathology of this disease and the personality changes. No one has found any single personality change which can be considered of any statistical significance.

Results of therapy have been rather discouraging until the recent report of I. S. Wechsler in which he

states that the use of alpha-tocopherol in three cases resulted in startling improvement in two cases.

*Case Report.**—A white man, aged fifty-nine, was admitted to the psychopathic ward from the workhouse where he was serving a sentence for disorderly conduct. He had entered one of the large department stores demanding to see the president of the company. He refused to have anything to do with anyone except the president, because he felt only the president could straighten out his grievance. He had had trouble with that store about three years previously and he had continued to hold a grudge. At that time his conduct had not been considered dangerous. At the present time, however, he threatened bodily harm to the office personnel.

Upon arrival at the hospital he was indignant. He told a long, involved, scrambled, wandering story of the brutal treatment he had received from the hands of the employees of this store. He spoke in a loud vehement manner frequently repeating meaningless details for emphasis. He would frequently wander from the point of the story to bring in some unimportant detail.

He stated that one year ago he had noticed weakness and stiffness in his legs and arms. He noticed in particular that his hands were becoming clumsy, stiff and weak. He very boastfully said that about three months previously, a doctor had told him that he had the same disease as Lou Gehrig.

Physical examination showed claw hands and atrophied muscles, spastic lower extremities, bilaterally positive Babinski and Chaddock signs. Blood serology was negative; spinal fluid, entirely negative.

During his stay in the observation ward, the patient spoke loudly, always demanding to be the center of attention. He was commanding and bossy. His mood was generally euphoric although at times he was easily angered. He would cooperate, only when by so doing he would be getting attention. He was oriented as to time, person and place. His recent memory was fair. He could repeat the cowboy story. He repeated an address after five minutes. He retained his persecutory ideas toward the employees of the store. He never threatened the staff. The patient was diagnosed amyotrophic lateral sclerosis with psychosis.

History of previous personality and family background could not be obtained.

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*Case taken from the Neuropsychiatric Service of Minneapolis General Hospital, J. C. Michael, M.D., Chief of Staff.

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN DAKOTA COUNTY

MENDOTA, the first permanent white settlement in Minnesota, is a small town located at the junction of the Minnesota and Mississippi Rivers, which derives its name from the Indian words meaning "the meeting of the waters." At first it was called St. Peters and its proximity to Fort Snelling, which was occupied the following year just across the Minnesota river in Hennepin County, was partly responsible for its growth. Mendota, although practically deserted today, is still interesting because of its location and the history connected with the old stone home of General Sibley.

The first force of ninety-eight soldiers and twenty boatmen arrived at St. Peters in the fall of 1819 and at the time of their arrival, almost half of the men were suffering from scurvy. This disease continued through the winter in an extremely malignant form. For a time garrison duty was suspended since there were only enough well men to care for the ill and bury the dead. Stories are told of men who went to bed apparently well and were found dead in the morning. General Sibley told of a soldier who, being relieved from his tour of sentinel duty, stretched himself upon the bench of the guard room and four hours later when he was called upon to resume his duty was found to be lifeless.† Colonel Leavenworth, who was the first commander at Fort Snelling (or Fort St. Anthony as it was then called), set out with a party through Indian country searching for antiscorbutics. Spruce was obtained from the St. Croix and Chippewa Rivers and vinegar at Prairie du Chien. Nevertheless, nearly half of the company died. At this time, Major Edward Purcell was the surgeon stationed at the post.

This illness returned again the following winter. It was finally discovered that dishonest contractors, from whom the settlement's supply of salt pork had been ordered, had drawn the brine from the barrels at St. Louis in order to lighten the load and refilled them again with river water just before delivery at the post. This fraud was not uncovered until after two seasons.

No other settlements were made in Dakota County until 1851, when the Mendota treaty was made with the Indians who agreed to give up their land on the west shore of the Mississippi.

At this time the first actual settlers came to the Kaposia Mission, south of Saint Paul. Previous to that date only traders and Indian farmers had frequented the mission which had been kept by Rev. Thomas S. Williamson since 1846. Rev. Williamson had received the degree of Doctor of Medicine from Yale University in 1824, but had given up his medical practice in 1833 when he began to study theology. He practiced as a physician, however, in Minnesota. When settlers began to come to Kaposia he moved to Yellow Medicine, where he continued his services as a missionary.*

In 1821 a Lieutenant Oliver of the army, while on his way up the river with

†See the article entitled "Edward Purcell, the First Physician in Minnesota" which will appear in a later issue of MINNESOTA MEDICINE.

*See the article entitled "The Missionary as Practitioner," and the articles written by Rev. Williamson, MINNESOTA MEDICINE, October, 1940, pp. 723 and 725.

supplies for the garrison was forced by the ice to spend the winter at the present site of Hastings. From this time until 1851, the place was known as Oliver's Grove or more generally, Olive Grove. Joe Brown, a private soldier of Fort Snelling, was sent from time to time to herd cattle because of the fine grass in the region. In 1850 Alexis Bailey, Sr. established a trading post there and built the first log house. The next year, when it was deemed safe for settlers to come, Dr. Thomas Foster, the first practising physician in the county, built the second log cabin on the shore of Lake Isobel, on a site which he had picked out the year before. About the same time Alexis Bailey sold a one-fourth interest in his property to H. G. Bailey, his son, General H. H. Sibley, and Alexander Faribault. The town plan was laid out in 1853 by John Blakely. In 1854, General W. G. LeDuc bought out Alexander Faribault's interest in the town for \$3,000 and also purchased from H. H. Graham a claim of 160 acres adjoining the falls of the Vermillion, now within the city limits. Each of the original proprietors suggested a name for the town and, by drawing lots, General Sibley's middle name, Hastings, was chosen.

The growth of the settlement, like many others of the period, was extremely rapid. The first ferry across the river was established in 1854 by Wm. Felton. The immigration was such that, at ten cents per person, the day's receipts often amounted to eight or ten dollars.

The next year the first hotel, the New England House, was built. In 1856, General LeDuc took charge of the town site for the company and homes and stores went up rapidly. In January of that year the population was about 700 persons; by the end of the year it numbered 1,918. In 1857 the city of Hastings was incorporated by the territorial legislature and at the election in May, a physician, A. H. Hanchett, M. D., was elected mayor. The same year the county seat was moved from Mendota to Hastings.

Scurvy was prevalent in various settlements. In the reminiscences of the Honorable Thomas C. Hodgson who, when a boy of twelve years, spent the winter of 1854-55 in the company of four men at "Club Creek," now known as North Greenvale. Their purpose was to locate and build homes for each family. About mid-winter one of the men developed the symptoms of hypochondria. By March another began to complain of severe rheumatism and soon after Hodgson developed the same symptoms, but his pride forced him to say nothing about it. In April, two of the men started out for Hastings, and a third followed in a half-demented condition. Hodgson and Kegg, the remaining men, were both very feeble and both thought that they probably had leprosy. Their meat supply was exhausted, their flour supply was very low, and they also started to make their way by slow stages to Hastings. At Lamphrey's, near Waterford post office, they were given lodging, and there they met a small group of settlers going to their little colony. Hodgson returned with them, but was soon in such a state that he could not even walk. Fortunately, however, a stranger who was posing as a government inspector of boundaries stopped at the shanty and found Hodgson almost dead from scurvy. The man admitted that he was a physician, ruined from drink, and that he had been known formerly in Indiana as Dr. Charles Ferry. The disease was diagnosed, and the boy was given a diet of raw potatoes and lightly boiled eggs. He finally recovered although he remained stunted in growth.

1850-1859

Of the physicians who practiced in Dakota County in the fifties, Dr. Thomas Foster had quite a varied career aside from his medical practice. He came to

Minnesota as private secretary to Governor Ramsey and edited newspapers at Hastings, Saint Paul, Minneapolis, and Duluth. He was a member of the constitutional convention and was also state librarian. Of Dr. A. H. Hanchett, the first mayor of Hastings, little is known. He had an office for a while with Dr. William Thorne. He resigned soon after his election and later went east to live. Doctor Thorne was born in Devonshire, England, in 1820. He came to New York state in 1833. He studied medicine with several physicians, took some preliminary lectures at Buffalo College in 1847, practised for a short while and received his degree of Doctor of Medicine from the Buffalo Medical College in 1850. In 1856 he came to Hastings. He was a charter member of the Dakota County Medical Society and also a member of the State Medical Association and the American Medical Association.

In 1856 the *Dakota Weekly Journal* printed the cards of William Gibson, M. D., and D. S. Cummings, M. D., who specialized, according to his card, in the diseases of women and children, and E. D. Ayres, M. D., physician, surgeon, and oculist. The latter also ran a drug store. In 1856 Dr. Horace Phelps came to Lakeville and Dr. T. C. Potts came to Castle Rock township where he practiced for about seven years. There was also a Dr. E. Hammond who came to Waterford that year but there is no record of his having followed his profession in Dakota County.

The next year J. M. Whipple, M. D., published a card advertising that he gave "particular attention to the diseases of the eye and ophthalmic surgery" and also sold drugs and medicines. Jeremiah E. Finch, M. D., one of the well established and well known physicians of Hastings, arrived in 1858. Dr. Finch received his academic and medical training in the east and practiced for a short time in Illinois and Wisconsin. In 1862 he was appointed surgeon of the Seventh Minnesota Infantry and the next year returned to Hastings. He owned a drug store there, served a long term as president of the school board, and was elected mayor in 1866.

The first dentist, H. O. Mowers, and two more druggists came to Hastings in 1858, and in the following year Dr. Otto Stannis, the first homeopath in the county, arrived. He had received his training in Germany and had practiced both in that country and in the United States.

C. P. Adams also came during this period. He was born in Pennsylvania in 1831, and was of Scotch-English and German descent. He studied in Pennsylvania and Ohio and graduated from Ohio Medical College in 1851. He first began practice in Indiana, but his health being injured by malaria and overwork he came to Hastings. At the age of twenty-five, he had the honor of being elected a member of the territorial legislature, and was appointed chairman of the committee on corporations. In his first years in Hastings he supplemented his earnings from medical practice by running a grocery store and editing the *Hastings Democrat*. During the early days of the Civil War, Dr. Adams was instrumental in securing aid for the families of volunteers in the army. His own military record was a meritorious one. He enlisted as a private soldier in the Dakota County Volunteers and was elected captain of his company. He was promoted the next year to the rank of major in the First Minnesota Regiment of Volunteers and in March, 1865, was made a brigadier general. According to the history of Dakota County written by Neill and Williams he was in every battle from the first battle of Bull Run to that of Gettysburg. He suffered severe wounds and was at one time left for dead on the field. He won renown as an officer and continued in

service after the close of the war. In 1866 he commanded a corps of cavalry and artillery sent against the Sioux Indians and was successful in his undertaking in spite of heavy snows and extreme cold. In July of that year he returned to Hastings and resumed the practice of medicine.

In 1869 Dr. Adams took an active part in the reorganization of the Minnesota State Medical Society and on its recommendation helped to organize the first medical society in Dakota County. He held many offices in both the state and county organizations. He was a member of the American Medical Association, an honorary member of the California State Medical Society, a member and ex-president of the Rocky Mountain Medical Society. In local politics his sympathies were with the Democratic party. He served as mayor of Hastings and also as a member of the state senate for a four-year term (1878-1882). Among other organizations to which he belonged was the Dakota County Veterans' Association for former Civil War soldiers which was organized in 1878 and of which he was the first president.

1860-1869

Among the physicians who came to Dakota County in the sixties were Francis B. Etheridge and Levi P. Dodge. The former's professional card first appeared in the *Hastings Independent* in May, 1860, wherein he stated that he had had thirty years' experience in his profession. He was a surgeon with the rank of major in the Fifth Regiment of Minnesota Volunteers during the Civil War. He was taken prisoner at Corinth, Mississippi, and returned to resume his practice in Hastings late in May, 1862, his health somewhat impaired by his war experiences. Levi P. Dodge was born in New Hampshire in 1839. He was left an orphan at the age of six months and from the age of eight years he cared for himself. After studying medicine with Dr. S. M. Whipple, he enlisted in the army in New Hampshire and received an appointment on the medical staff which he held until 1863. He entered the medical school at Dartmouth and received his diploma that same year. After practicing in New Hampshire he came to Farmington in 1865.

Jenks S. Sprague, who will be mentioned later, came about this time. Other physicians of this period who practiced in Dakota County were Dr. J. L. Arming-ton, who was a surgeon with the rank of major during the Civil War; J. G. Bemis of Farmington and E. D. Ault, a graduate of McGill University, Canada. The latter's card announced him to be a "physician, surgeon, and obstetrician, late of the New York Hospital." Dr. Ault was also an agent of the Mutual Life Insurance Company of Boston, supplementing his income by a side line, which was not an unusual procedure for physicians during these years. Dr. D. L. Webster, Dr. C. C. Richter, Dr. Nichols, homeopaths, and Dr. J. Davidson, an eclectic physician, practiced in Hastings. Dr. Weems ran a drug store there for a number of years. There were also a number of physicians scattered over the county of whom very little is known and there were of course the "traveling physicians" whose spectacular "cure-all" advertisements and guarantees often covered half sheets of the local papers. In 1867 the *Hastings Gazette* printed a list of those men who, having complied with the laws passed by the state legislature requiring an examination or an exemption certificate, were qualified to practice medicine in the state. As this list included only four names, C. P. Adams, L. P. Dodge, R. L. Weems, and R. F. Goodwin, it was probably an incomplete one.

HISTORY OF MEDICINE IN MINNESOTA

The following are listed by Mitchell in his history of Dakota County as the practicing physicians of that district in 1868.

L. P. Dodge, Empire
J. G. Bemis, Empire
Dr. Torgerson, Empire
T. N. Berlin, Empire
Wm. Thorne, Hastings
J. E. Finch, Hastings
C. P. Adams, Hastings

J. S. Weems, Hastings
H. D. L. Webster, Hastings
F. B. Etheridge, Hastings
Wm. Willson, Hastings
Dr. Munson, Pine Bend
Dr. Barton, Pine Bend
C. C. Knight, Rosemount

The first expenditure of county funds for persons requiring medical care was made in 1865 when the poor bills covering the year from March, 1864, through March, 1865, were listed as nearly \$300. This included the salary of Dr. J. E. Finch for his services as county physician, medicines for the poor, and extra expenses for post-mortem examinations. There was, apparently, only one office of county physician in the sixties and the expense list as given above was probably about the same for the following years.

According to the *Hastings Independent*, March 28, 1861, there was an epidemic of diphtheria that year and the disease was referred to as being "of considerable interest in the community at present." Typhoid fever was prevalent and severe in Hastings in the winter of 1865-1866. In August, 1866, several persons on the steamboat "Canada" were stricken with an illness described as "cholera morbus." Two persons were buried at La Crosse and six at Reed's Landing, and Hastings officials, who very probably feared that the disease might be dreaded Asiatic cholera which in previous years had been brought up the river, prudently telegraphed the boat not to stop.† There was a considerable amount of bowel disturbance accompanied by fever in the summer of 1868 and the next year whooping cough and measles attacked the children.

The obvious reluctance of the newspapers to mention any illness in the community and the vagueness and indecision with which they did so is explained in the course of an argument between Dr. Adams and a man named Graves. Dr. Adams, at a meeting of the state medical society had read a paper which was later published in the *Northwestern Medical and Surgical Journal*, in which he expressed the opinion that the unhealthy lowlands around Hastings might be largely accountable for the illness in that vicinity. As examples he called attention to the malaria prevalent in 1856 and the unusual amount of typhoid fever in 1858. Those who objected to the opinions held by Dr. Adams and his medical associates argued that there was remarkably little illness in the county, that stagnant water had no connection with disease and, above all, that any mention of unhealthy conditions was unpatriotic to the community since it would scare away prospective settlers. It is also to be noted that neither during these years nor later was it a practice of the newspapers to publish articles on preventive medicine or the improvement of sanitary living conditions.

1870-1879

In 1871 Dr. D. J. Cummings reported a case of leprosy, the first that he had encountered during his practice in Dakota County. It created quite a little excitement in the village of Farmington. The next year there were rumors of smallpox and in February, 1873, a number of cases appeared in the German settlement at Hampton. In 1877 scarlet fever was prevalent in Hastings, Empire and Rosemount, as well as in some of the other towns, and it reappeared the two following

†See the account of the appearance of Asiatic Cholera in Ramsey County, MINNESOTA MEDICINE, issue of April, 1939, p. 252. Account of its appearance in Goodhue County will appear in a later issue.

years. There were a few cases of diphtheria reported in 1878 in Hastings and the next year (August) there were several cases at Castle Rock and also within a four mile area around Farmington. The surrounding sanitary and water conditions were reported as good and isolation and disinfection kept the disease from spreading. The same year an epidemic of diphtheria broke out in July and August in Lakeville where there were twenty-one cases in four families. Six deaths were reported. The total number of deaths from all causes for that year, in Dakota County, numbered 156, and of these eighteen were from diphtheria.

In 1870 the first medical society in the county was organized through the efforts of Drs. L. P. Dodge and D. J. Cummings of Farmington. The first meeting was held in Farmington in December and the physicians present included the two mentioned above, as well as Drs. J. S. Sprague, F. B. Etheridge, J. Dennis Smith, J. C. Fitch, J. E. Finch, R. L. Weems and C. P. Adams of Hastings. These included the majority of the important county practitioners. The name adopted for the organization was the Dakota County Medical Society. A committee of permanent organization composed of Drs. C. P. Adams, D. J. Cummings, and J. E. Finch, nominated the following who became the first officers of the organization:

President—J. S. Sprague
 Vice president—F. B. Etheridge
 Corresponding Secretary—L. P. Dodge
 Treasurer—J. C. Fitch
 Board of Censors—J. E. Finch, D. J. Cummings, and F. B. Etheridge.

The president, Dr. Sprague, had been for many years an active member of the State Medical Society of New York. He was president of that organization at the time the bill legalizing dissection in that state was passed and it was mainly through his efforts that the measure was enacted into law.

Committees were appointed to draw up a constitution and by-laws and to arrange the financial organization of the society. The next meeting was scheduled for the following March. According to the constitution adopted at that time membership was open, by a majority vote of the society, to any physician residing within the county who was a graduate of any medical school or a licentiate of any state or county medical society recognized by the American Medical Association. The admission fee was two dollars and at each annual meeting two honorary members over sixty years of age might be elected. The next year it was decided that meetings should be semi-annual (in January and in June) rather than four times a year. Dr. Sprague remained in the office of president of the society until 1874. Other physicians who served in this capacity during the seventies were Dr. Thorne (1874 and 1877), Dr. Finch (1875 and 1876) and Dr. Dodge (1878). In 1875 two new members, Drs. C. P. Fuller and J. R. Marvin, were elected.

The office of county physician remained the same as in the preceding ten years with much the same duties. In 1873 Dr. C. P. Adams was appointed county physician at the salary of \$200 per annum. 1877 Dr. Thorne received \$250 and in 1879 he received \$270 for the same services.

Visiting "physicians" gave series of lectures in the different towns several times a year. For example, in September, 1873, a Dr. Voltz lectured in German on physiology and anatomy. He was followed the next month by a Dr. Anderson who illustrated his lectures with charts and a manikin. The next summer a Dr. O'Leary of Boston gave a number of talks in the Hastings court house which were well attended. His wife gave two lectures to the ladies. Drs. Humphry and

Stoltz of the Winona Institute came to Hastings occasionally for short periods. Dr. C. A. Miner of Chicago made a regular habit of coming to Hastings every three months and there was a Dr. Wheeler "who for fourteen years traveled with the celebrated Indian doctor." Among the newcomers who remained in Hastings was Dr. R. Freeman who established an electro-thermal bath institute. He advertised widely in the newspapers but there is no indication that he ever attended a medical school. Some years later, after pleading guilty to running a house of ill fame, Dr. Freeman moved to Minneapolis. All degrees of quackery were represented yet such "physicians" must have had a moderate success since they continued their visits.

Drs. F. D. Chapman and G. H. Hawes were both reputable homeopaths who established themselves in Hastings.

Dr. L. M. J. Leonard and Dr. J. D. Brundage were among the regular physicians who settled as newcomers in Hastings. Dr. W. C. Eustis, who was one of the first students at the state university and who studied medicine at the University of Michigan, settled in Farmington. Drs. R. F. Goodwin, Dennis Smith and W. W. Furber each practiced in partnership with Dr. C. P. Adams for a short period. Dr. W. H. Thurmond came to Rosemount in 1879 and remained there several years.

1880-1889

During the first years of the eighties, Dr. P. A. Heitz, a member of the Missouri and the Minnesota State Medical Societies, settled in Hastings as did also Dr. Henry Hahn, formerly of Young America, and Dr. Alfred Adsit who became one of the prominent physicians in the city. Dr. E. W. Hammes located in New Trier where he was very well known for many years. Dr. H. C. Johnson located in Farmington. In 1889 Dr. H. Van Beeck, who served the county as physician and coroner for many years, opened an office in Hastings. Other physicians who practiced for short periods in the county were Drs. A. C. Dockstader, J. M. Tucker, W. F. Kertson, W. O. Tessier, W. R. Endris, James Gravelli, V. J. Hawkins and C. F. Miller.

In 1882 and 1883 there were a few cases of small pox and several deaths from typhoid fever. The only diseases that assumed epidemic forms, however, were scarlet fever and diphtheria. In the summer of 1881 the former was reported as "raging" in Hastings and the surrounding vicinity. Physicians were reported to have their hands full and authorities were taking steps to prevent its spread. It occurred again in the fall of 1882 in Douglas and Hastings and continued to be prevalent and severe until the spring of the next year. In 1889 there were a number of cases.

Diphtheria occurred in a mild epidemic form in Hastings and Vermillion in 1882 and severe cases were recorded in 1885 in Farmington and Vermillion. The citizens of Vermillion were finally stirred to organizing a local board of health under the charge of Dr. C. P. Adams. This board was to make rules and regulations, in conformance with those of the Minnesota State Board of Health, to prevent the spread of contagious disease. This, apparently, was the first local board of health in the county. Three years previous the state medical society had sent a questionnaire to leading physicians in most of the larger towns of Minnesota in order to make a survey of local boards of health.† Dr. L. P. Dodge of Farmington replied that there was no such board in his town, and in answer to

†Transactions of the Minnesota State Medical Society for 1882.

a question as to the chief difficulties which prevented the establishment of such a board, he replied that it was "the pure hellishness of a certain class of people that you will find in all communities but particularly in small towns—a class that cannot conceive of a medical man being interested in the well-being of his neighbors to the detriment of his own pocket." He suggested as the solution stringent laws and the means to enforce them. In Hastings also a board of health was organized aboutt his time. Dr. J. M. Tucker filled the office in 1886, Dr. H. Hahn served in 1887, and Dr. J. C. Fitch was elected for the two following years.

By 1880 the population in the county had increased so much that it was impossible for one man to attend all the indigent sick in the county. Consequently there were several county physicians instead of one. One physician was appointed to attend all sick persons in the county jail for the sum of \$100 per annum, another to attend those at the poor farm at Auburn for the same salary, and a third to attend all the county charges within a six mile radius from Hastings for \$150 per annum. These salaries included medicines. Since other physicians presented small bills to the county commissioners from time to time, it may be assumed that those who did not fall into the above districts were cared for locally.

These appointments were generally made by the commissioners on the basis of the bids received. There was an objection to this, as may be seen from the following statement which was presented to the commissioners in January 1887:

"We, the undersigned physicians and surgeons of Hastings and vicinity, believing it to be as unprofessional as it is uncomplimentary to receive employment as the lowest bidder, hereby refuse to tender our services as bidders to the commissioners of Dakota County for the medical and surgical treatment of the paupers, including inmates of the poor house and prisoners in the jail of said county.

"We believe, further, that said paupers and prisoners have as much right to choose their attendant as they have to gratuitous treatment at the county's expense.

"And we believe also that no physician whose name appears below will make exorbitant charges for services rendered the county, while, at the same time, all should be fairly remunerated for such services when faithfully and honestly performed."

This document, which was signed by all the reputable physicians practicing in the county at the time, included the following names: J. C. Fitch, A. M. Adsit, H. Hahn, J. E. Finch, G. H. Hawes, J. M. Tucker, P. A. Heitz, Wm. Thorne, W. C. Eustis, L. P. Dodge, H. C. Johnson, J. P. Caldwell, E. W. Hammes, C. P. Adams, and P. Barton.

A short time after this agreement considerable stir was occasioned among the physicians when it was learned that Dr. Henry Hahn, who had supported the movement, agreed to treat all paupers within a ten mile radius of Hastings including prisoners at the county jail and to supply all medicines for the sum of \$300 per year. Dr. Hahn met the barrage of criticism in a letter which he wrote to the *Hastings Gazette* and by a statement from the county commissioners in both of which he maintained that he did not bid for the position but that it was offered to him and he was not obligated to refuse. The situation was unpleasant, however, and Dr. Hahn left the city at the end of the year.

(To be continued in January issue)

President's Letter

THE PHYSICIAN'S REWARD

MEDICINE of tomorrow will be Preventive Medicine. It is in this field that the greatest progress can be expected. Prevention of disease is the highest attainment and the ultimate goal in medical achievement. To prevent disease is a much greater boon to humanity than curative measures.

Already progress has been made. Diseases and accidents in industry have declined markedly, and time loss has been greatly shortened. The same is true of diseases of childhood. Typhoid fever, smallpox, diphtheria, yellow fever, and malaria are among the diseases that should not exist in any intelligent country, now that we have learned how to control their occurrence. The next step will be control of tuberculosis. The prevention of tuberculosis in cattle has been so spectacular that our State Medical Committee on Tuberculosis is fully convinced that this disease should and can be prevented in the human family. November 7, 1940, may be looked upon in the future as an important date. On that night in Meeker County a movement was started by organized medicine to eliminate all tuberculosis in that county. If successful, and we believe it should be successful, other counties will follow suit, and we anticipate the day when tuberculosis in our state will be as completely controlled as is typhoid or diphtheria.

Many diseases are still beyond the reach of medical science. This is particularly true of those diseases most common in middle and advanced age. The degenerative diseases, such as cancer, hypertension, renal, and cardiac diseases, are increasing in incidence with a steadily growing mortality rate. The treatment of these diseases, unless detected very early, is palliative only. If allowed to become firmly entrenched, eradication is usually impossible.

This brings to the fore a duty as well as an opportunity, which the great body of physicians does not yet fully appreciate; that is, thorough periodic physical examinations. In the University of Minnesota Student Health Service every new student is given a comprehensive medical examination. Those in charge claim that one of its most important functions is in educating the student to have periodic physical examinations. Many larger clinics and many individual physicians stress this matter. But to large numbers of physicians, it is a subject to which too little attention is given, partly perhaps because the physician does not feel qualified to carry out the details required, and partly because he does not realize its importance. A periodic examination, to be of any value, must be thorough and complete. A physician must be observant and painstaking. A mere casual examination is not of much value. To be worthwhile to the individual the examination should be repeated annually and more frequently in case of suspicious findings. Not only should the examination include a full general physical examination, including heart, lungs, blood pressure, blood and Wassermann, but particular attention should be given to the cardio-vascular-renal system, the entire gastro-intestinal tract, and the genito-urinary tract. Many cancers can be discovered by this means sufficiently early to obtain surgical cure. Many individuals with beginning cardiac, renal, or hypertensive troubles, if caught sufficiently early, can be advised how to live so that progress of the disease may be kept minimal and a useful life maintained. Too many catastrophes are occurring every day which might have been avoided had foci of disease been discovered in time and proper measures instituted.

A complete, thorough, physical examination requires much time and intensive effort on the part of the examining physician, and in many cases a meager fee can be expected. But if we are to measure up to our responsibility as physicians, we must realize that this is one of our most important duties to humanity. To a true physician the welfare of his patient is of first importance—his chief reward is the satisfaction of having given the best advice and service possible.

B. S. ADAMS, M.D.

President, Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL
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BUSINESS MANAGER
J. R. BRUCE

Volume 23 DECEMBER, 1940 Number 12

THE PROFESSION AND THE DRAFT

IN KEEPING with the resolution passed by the House of Delegates of the American Medical Association last June in New York, and in keeping with professional principles, the medical profession is donating its services in connection with the draft as its part in the national defense program. Physicians over the draft age and not members of the military service or reserve have volunteered to serve without pay—one in each district—to examine those drafted. Advisory boards consisting of specialists give their services when requested by the district examiner. Then the state has five appeal boards, each consisting of seven lay members and one physician, to which the registrant can appeal. These medical services are rendered gratis and

no provision has been made for fees except for certain laboratory examinations.

Induction into the service takes place at just one place in the state—Fort Snelling. Here the so far accepted soldier undergoes another physical examination at the hands of an induction board made up of a group of civilian specialists, who may be called upon to spend several days a month. The members of this board are compensated at the rate of a major's pay. The intent is to have this examination so thorough that experiences following World War I will not be repeated.

It is the purpose of the defense program to mobilize a sufficient body of men without disrupting civilian life more than necessary. That considerable disruption will occur, however, is unavoidable. In the medical profession, for instance, there are some 608 Reserve Officers in the state, subject to call on only ten days' notice. This is obviously too short a time for a physician to arrange for the medical care of his patients and for disposition of his family and business affairs.

Then there are the several hundred medical students, interns and young doctors in the draft age group. The drafting of medical students and interns is deferred to enable them to complete their training. It is the purpose of the military authority to place inducted men according to their trade or professional fitness. As the enlisted personnel increases and the need for physicians in the service increases, there is no doubt but what inducted physicians will be given commissions as first lieutenants whose salaries are \$2,695 for single men and \$3,152 for married men.

The chairman of the committee for Minnesota of the Committee on Medical Preparedness of the A.M.A. and chairman of the Committee on Military Affairs of the State Association, Dr. F. L. Smith of Rochester, reports that 93.4 per cent of the questionnaires sent to the profession of the state by the A.M.A. have been filled out and returned. Those members who have not so far returned these questionnaires are requested to do so. Duplicate forms may be obtained from

Mr. R. R. Rosell at the office of the Minnesota State Medical Association, 493 Lowry Medical Arts Building, Saint Paul. The Seventh Corps Area, under the leadership of Dr. R. M. Fouts of Omaha, is the only district that shows a better coöperation by a better percentage return of questionnaires.

Reserve officers are inquiring as to the likelihood of their being called into service. Dr. Smith states that medical officers of company grade are likely to be called first, before those of field grade. A questionnaire was sent out by the First Military Area shortly after the A.M.A. questionnaire was mailed, in which the question was asked, "How much time is needed for closing up local affairs before going into active duty?" Presumably the desires of reserve officers as expressed in this questionnaire will receive consideration.

The preparedness campaign is a stupendous undertaking and is vital, although we are not at war. The unanimity of public opinion as to the need for defense is gratifying. The medical profession is doing its part in connection with the draft.

THE BLOOD BANK

MOST hospitals have either a "blood bank" or its near equivalent; that is, a list of readily available donors of known groupings and negative flocculation tests. A hundred years ago Blundell pointed out that hemorrhage is the most important indication for a blood transfusion.¹ This, we feel, is still the primary need for whole blood, but it must be granted there are many other indications in which whole citrated blood is invaluable. However, the intravenous administration of blood plasma is recognized as a rational procedure in the treatment of secondary shock resulting from the loss of blood plasma with consequent hemoconcentration. In our mechanized life where war, automobile and industrial accidents occur, and also where burns, operations and states of hypoproteinemia are met with daily, the use of blood plasma is proving of real value.

The blood plasma may be obtained from the citrated bloods in the "blood bank" by siphoning off the supernatant fluid from the cells which have been deposited at the bottom of the container after several days' storage. If fresh blood

plasma is preferred, blood is withdrawn from a donor, the cells are separated from the plasma by centrifuging, and in turn the supernatant plasma is siphoned off. The blood plasma from various donors can be pooled irrespective of the donors' groupings. In turn the individual or the pooled plasmas can be administered subcutaneously or intravenously, irrespective of the recipient's blood grouping. In an extreme emergency this eliminates the necessity of knowing a prospective recipient's blood grouping if a plasma transfusion is needed in a great hurry. Liquid blood plasma can be stored at room temperatures for indefinite periods, the addition of 1:10,000 aqueous solution of merthiolate (sodium ethylmercurithiosalicylate) acting as a bacteriostatic agent. For increased convenience of storage or transportation the citrated blood plasma may be dried to a powder and kept in a sterile container.² For use the powdered plasma is dissolved in sterile distilled water. Investigations now in progress will eventually lead to the development of a mixture of materials already known which may provide us with a synthetic dried plasma or its equivalent. As experimental and clinical data continue to be presented to the profession, we shall become convinced of its value in specifically indicated cases. It would be a considerable contribution to medical science if quantities of blood were given voluntarily to provide material to carry on this work.

JOHN S. LUNDY, M.D. and
THOMAS H. SHELDON, M.D., M.S. (Anes).

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A CLINICAL COMMENT ON THE USE OF BARBITURATES

SOME clinicians are fully aware of the over-enthusiastic use of metals in syphilis. The syphilis "is cured" but the patient may have a nice hard liver or a full blown arteriosclerosis. Nothing very definite has been established on the end-results with the use of the barbiturates. The commonest associated clinical lesion in an epileptic colony was biliary tract disease.⁴ This was blamed on the prolonged use of phenobarbital. Acute poisoning has occurred with clinical dosage in cases of idiosyncrasy. Untoward action has

been noted in patients with cardiorenal involvement.⁵ The psychiatrists are growing wary of the barbiturates.⁶ State laws have been passed to inhibit indiscriminate use of the barbiturates, mainly to avoid homicidal intent.^{1,2,3}

Aside from these dramatic possibilities, there still is a phase of barbiturate usage which deserves comment. The barbiturates have their place as a hypnotic or sedative or analgesic in emergencies in fairly healthy patients. Never have there been drugs which make sleep so easy. But their continued use for this purpose is a questionable procedure. Such use has often fogged the issue in bedside consultations. Increased nervous irritability has been observed. A sort of delayed reversible action is sometimes established. All of which prolongs hospital stay and demands reeducation of sleeping habits. In the average situation why not go back to our old friends, hydrotherapy and psychotherapy to bring about sleep? But that is work. Work for the doctor; work for the nurse. There is the rub. Sleep made easy for all concerned seems like an ideal arrangement. These drugs have made the clinician "soft"; the nurses lazy. When it comes to the problem of sleep for a patient, the old gag about the WPA worker has "nothing on us."

—H. L. ULRICH

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FOR COUNTRY

FEAR, though unwarranted, that a change in the attitude of our government towards warring Europe would follow a change of administration at Washington, doubtless accounted in part for the outcome of the recent election. The acceptance of the will of the people as expressed in the post-election radio address of the defeated Republican candidate was a fine example of good sportsmanship. The sentiments expressed could well be adopted by the medical profession.

The medical profession should and will join the government to present a united front to foreign nations. As to domestic affairs, however, we shall continue to fight for what seems right for our country and our profession, as we see the right. We shall fight for the preservation of the American system of medical practice as expressed in the Platform of the American Medical Association. We may well add to our objective the support of the American system of private enterprise in all lines of activity.

It is with some satisfaction that we note that the government's suit against the American Medical Association is postponed indefinitely. We should think the government had more important things to do. It may be, too, that the enormous sums being appropriated for national defense will indefinitely postpone the consideration of governmental expenditures of Wagnerian proportions for medical activities.

There is no reason, however, to expect that there will be a total let down in the activities of those Utopia-minded citizens for whom state medicine is the final and only answer. The recent attempt on the part of the U. S. Public Health Service to utilize the draft for a public health measure is an indication of how the national emergency may be used in the future for a smoke screen in advocating pet measures. It behooves the profession as individuals and in groups to be on the alert to bring into the open and oppose extreme socialistic trends in government. This is not inconsistent with wholehearted support of the government in international affairs.

MORE OR LESS OF A QUACK

EACH month reports from the State Board of Medical Examiners concerning investigations, arrests and convictions of persons who have attempted to practice medicine without a license are published in MINNESOTA MEDICINE.

The number of convictions among these cases is extremely high. That means that the State Board and its attorney are doing their work with great care and efficiency. It also means that they have coöperation of a high order from law-enforcement agencies and courts of Minnesota.

It is rare, however, for a judge of the district court to issue the kind of rebuke administered

by Judge Gustavus Loevinger of Saint Paul in the case against a Saint Paul chiropractor, Edward Ferdinand Jacobson, who pleaded guilty to the charge of practicing medicine without a license in Judge Loevinger's court last month.

The complete text of Judge Loevinger's remarks and of the entire Jacobson case appear on page 877 of this issue. They should be read by every physician. It is unfortunate that they could not have been heard in person also by every holder of a license to practice healing who is tempted from time to time to overstep his own qualifications and the field in which his license permits him to practice.

The effects of the rebuke by the Court upon the man who was sentenced in this case was undoubtedly considerable and it probably extended to his friends and even to associates who were not in court to hear Judge Loevinger pass sentence.

Physicians who read it in full will be especially grateful to Judge Loevinger for his understanding of medical ethics and requirements and for the humanitarian feeling displayed in his remarks.

"It is unfortunate," the Judge said to the chiropractor in this case, "that when some people are in physical trouble, when they are ill or have any other physical difficulty, instead of going to some person who is qualified to treat them, they are likely to go to some person who is more or less of a quack in that particular line. I am not reflecting on your ability as a chiropractor, but on any other line you are just a quack. You have no authority to practice medicine and anyone who pays you money, therefore, pays it to you under false pretenses."

This is a forceful statement of the case against the practice of medicine by unlicensed and unqualified practitioners of any kind. Coming from a jurist of Judge Loevinger's standing it is likely to have a very wholesome effect on the shady fringe and also upon all who do not draw the line carefully, dividing their field from the legitimate practice of medicine.

It is to be hoped that it will also open the eyes of a few patients to the limitations of some fields and some practitioners who are licensed under the law to practice healing in Minnesota.

CHRISTMAS SEALS

A CALL for the enlistment of all of our people in the crusade against tuberculosis is made by Dr. Nathan B. Van Etten, president of the American Medical Association, in a statement issued in connection with the thirty-fourth annual sale of Christmas Seals.

Dr. Van Etten's statement follows:

"We have come to a time when every health agency must be mobilized for national defense. Defense against disease is quite as important as defense against a military enemy. Education has played a most important part in the defense of our people against the invasion of tuberculosis. We must not only consolidate our gains, but we must push forward with objective planning. The enlistment of all of our people in the crusade against tuberculosis through subscription to the Christmas Seal Sale is more important than ever before—and all of us should do our best to promote a continuous campaign."

COST OF TUBERCULOSIS

Tuberculosis, during and after the World War, has cost approximately \$960,000,000 to date in compensation, vocational training, insurance and hospitalization. The moist rôle, which was the criterion of fitness for the World War, is shown by experience, much of which has accumulated since that time, to be much less reliable than radiography in situations analogous to the examination of recruits. A huge amount of compensation has been paid out to men manifestly tuberculous at the time they were sent to camp who should have been rejected by the local draft boards, but were not.

A normal chest roentgenogram should be the criterion of acceptance in a future mobilization, including the draft for training, and it should be made and reported before the recruit has spent a night away from his own roof to obviate a repetition of the claims for aggravation of pre-existing tuberculosis which occurred during and after the World War.—RAMSAY SPILLMAN, M.D., Jour. A.M.A., Oct. 19, 1940.

REPRINTS REQUESTED

Notice has been received from the Surgeon General that the Army Medical Library will gratefully receive reprints for filing under the author's name. Thus the bibliography of any writer will be readily available and the reprints will provide an additional source of material for loaning. MINNESOTA MEDICINE will automatically send reprints of articles ordered to the Army Medical Library at Washington.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

IS THERE A DICTATORSHIP IN THE AMERICAN MEDICAL ASSOCIATION?

An article recently published in *The Public Opinion Quarterly* entitled "Organized Medicine Enforces its 'Party Line,'" by Oliver Garceau is typical of many recent articles which contain biased and misinformed criticism of the American Medical Association by the layman advocate of reform in medical practice. This article is largely devoted to a critical discussion of the attitude of medical organizations toward reform in medical practice and the methods employed by the officers of the American Medical Association to influence the opinions of its membership.

Lack of Culture Charged

The author introduces his diatribe by accusing the physician of a lack of culture and intellectual background, and states that he has no interests other than medical. To those of us who know of the many members of our profession who have shown an active interest in various arts and sciences the accusation seems ridiculous. The physician's love of music is attested by the existence of several excellent orchestras which are composed entirely of physicians, as well as many other orchestras in which they form a large portion of the personnel. Several exhibits of paintings which have appeared in recent years have been contributed entirely by members of the medical profession. Some of these paintings have received national recognition.

All Arts Among Hobbies

Anyone who has visited the various hobby shows conducted by county and state medical societies would realize the wide variety of interests with which the medical mind has occupied itself. The field of literature has been overwhelmed in recent years with contributions from

the ranks of physicians. It is true that some of these publications are of questionable merit, nevertheless there are a number which have received unusual recognition and several are included in the list of "Best Sellers." In fact, it would seem that the only fields which the physician has not invaded in large numbers are the narrow lanes of economics and sociology, from which the author makes his academic criticism. Although it is true that there are not many physicians who are instructors in these fields, nevertheless there are a number who have given these subjects careful study and are not entirely unfamiliar with the problems involved.

It's a Common Fallacy

The author of this article is guilty of a fallacy common to many reformers who are critical of the policies adopted by the American Medical Association in assuming that the Association is so organized that it can dominate the opinions of its members. He fails to realize that the policies adopted by the American Medical Association are guided by the convictions of the majority of its members. The intelligent-minded liberty loving physician would resent the dictation of any medical oligarchy. In fact, the officers of the American Medical Association have been criticized sometimes for their conservatism in carrying out new policies advocated by branch societies. The answer always has been that they wanted to be sure that it would have a favorable reaction among the rank and file of physicians and among constituent societies before adopting a national policy. If there ever was a truly democratic and representative body it is the House of Delegates of the American Medical Association. The members of this well-informed, intelligent body would vigorously represent the charge that their opinions were being forced into line by the officers of the American Medical Association.

They Needed No Urging

It hardly seems possible that anyone, unless his vision were obstructed by cloistered academic walls, would criticize the American Medical Association for its efforts in perfecting the medical defense of the nation. The members of the A.M.A. wish no credit for doing their patriotic duty. Their only desire is to be of every possible aid to national defense, and that their efforts may not be hampered by literary sniping and ill-advised threats from the Department of Justice. The members of the American Medical Association needed no command or urging from their officers to volunteer in defense of the nation. The medical officers of the Army and Navy were the first to receive the coöperation of the members of the A.M.A. when the emergency arose. It might be said that if other fields of national defense were as well equipped and ready for action as that of the medical profession, there would be but little danger of invasion of the western hemisphere.

A large part of this article is devoted to a discussion of the methods employed by organized medicine in enforcing its policies, and the influence exerted by the *Journal* of the American Medical Association. He admits the excellence of the *Journal* and the strength of its editorial policies, but grossly exaggerates the influence it has on the readers. Although the virile editorials usually reflect the thought of the majority of the members of the Association, differences of opinion have arisen from time to time, which have been freely aired in the House of Delegates.

Editors Would Resent

The author apparently believes that the opinions of physicians concerning the economic phases of medicine can be held in line by the editorial columns of the *Journal* as easily as the recent barrage of articles on reform seems to have influenced a section of the laity. The statement that the various state medical journals merely echo the sentiments expressed in the editorial columns of the *Journal* of the A.M.A. would be vigorously resented by their editors. In singling out the militant editor of the Illinois Medical *Journal* as an example the author makes a grievous error, since the worthy gentleman usually is several laps ahead of the rest of us. It is insinuated that officers of the American Medical Association go around pussyfooting

among the various state societies to discover any evidence of insurrection against the policies of the A.M.A. The author evidently is not aware that no representative of the A.M.A. attends a meeting of a constituent society unless he is invited. There is no field officer of the Association and many of the state societies would resent the suggestions of such an officer if appointed.

Object is Public Welfare

Attention is called in the article to extreme methods which have been employed occasionally by some of the medical societies in dealing with their members who violate the principles of medical ethics. There may be some justice in this criticism. It is open to question whether medical organizations should adopt methods of enforcement commonly employed by trade unions. Average laymen, however, do not realize that the main objective of the principles of ethics adopted by the medical profession is to further the best interests of medical care and the public health. If they also confer any economic advantage, as the author intimates, it is a secondary consideration.

Ignorance concerning the details of organization of the American Medical Association and failure to appreciate the various factors involved in carrying on its activities and in determining its policies is common to most social reformers. If they would take the trouble to make a careful and unbiased investigation of the facts involving the A.M.A. and its activities, as well as a careful study of all of the factors involved in the present methods of medical practice, there are not many who would write the articles they do.

W. F. B.

WHAT ABOUT THE YOUNG DOCTOR?

Draft board examinations are now under way and the machinery virtually complete for final induction of draftees—from a medical standpoint—to the centers for military training.

Preparedness questionnaires have also been filled and mailed to Chicago by the vast majority of Minnesota physicians.

With these essentials to the National Defense plan out of the way, the problems of individual physicians who are expecting to go into service, for a limited period, themselves, demand attention by both army authorities and medical organizations.

In time of actual war, the punch card information on every doctor, now in possession of the American Medical Association and the War Department, will undoubtedly be put to use. On a wartime emergency basis, physicians who are not eligible for active duty will undoubtedly be sent by the government to fill the gaps.

Peacetime Problem

But we are not functioning now on a war emergency basis. Will the War Department and the American Medical Association arrange for substitutes for the young physician who, for example, is a member of the Reserve Corps and will perhaps be called to service soon and upon short notice? Will they protect his lease, his investment in the tools of his trade? Take the case of the young physician who practices alone in a small community. He has built up a promising practice; he has long term obligations for office equipment and, probably, a long term lease for office space. What is to become of this young physician's practice during a period of his peacetime service with the military forces?

Many plans have been proposed to take care of this young physician. Several state and county medical societies have drawn up schemes. A New York plan calls for a substitute who will turn over all fees collected to the county medical society for the physician's account. Other plans call for a substitute who will retain half the net income of the practice, depositing the other half for the absent physician with the county medical society.

Penalty Unfair

Obviously, no matter how careful and ethical the substitute may be, no practice can be turned back intact to a physician.

Some patients will object to the substitute; others will prefer him and, if he refuses to accept them after their own physician returns, they may go elsewhere. In any case, a costly equity in equipment and office space may be lost.

These problems must be discussed fully and some solution discovered—if an unfair penalty is not to be imposed upon many patriotic young physicians who have more than a job to lose when they give their services to Uncle Sam.

PHYSICIANS MUST WATCH

In company with commentators and columnists of all shades of opinion, doctors are wondering what direction the third term will take.

According to most, the direction will be far different from that of the second term, just as the second term was different from the first.

The special interest of physicians lies, of course, in possibilities for expanding the Social Security Act and particularly for early passage of a new national health program.

Current Washington comment is unanimous in a belief that this time the administration is prepared to enter upon a world stage. In the years just ahead the power and influence of the United States is to be directed toward a hemisphere New Deal and domestic reform, according to this opinion, plays very little part in any planning now under way.

"More inside attention is being given to a nod of approval by the Emperor of Japan," says the *United States News*, "or to a statement by America's Ambassador, Joseph Grew, than is being given to broadening Social Security legislation, or for creating health insurance or for injecting more reform taxation into taxation policies at home."

The danger to American forms of medical practice obviously lie not so much by way of pending legislation but in the sweeping regulations that may be made, ostensibly, to speed and strengthen national defense.

Physicians who are doing their utmost to aid the National Defense program must also watch closely to see that an exclusively military program does not almost insensibly become a domestic reform program carrying with it the worst aspects of government medicine for the civilian population.

"WHAT IS YOUR ANSWER?"

[Monthly Editorial Prepared by the Medical Advisory Committee]

The type of medicine and surgery practiced in Minnesota today is as efficient as any carried on any place in our country and yet the men of our society are still menaced by entirely too many malpractice suits. How can this be? Each reader may have his answer to the question.

Can it be that in our endeavor to obtain the perfect result, we are overdoing our treatment, especially in the fracture case, and defeating the endeavor of nature to help us to effect a cure?

Is it that we are depending too much on the results of so-called scientific research and the newer medical drugs and too little on common sense in the treatment of diseased conditions?

Are we jumping at conclusions from laboratory studies before taking into consideration the findings of a careful and pains taking history?

Do we, because of the medical education which we have, hold ourselves aloof from the commonplace and forget that tact and courtesy are of great use in the dealing with any type of psychopathic personality?

These, and many other questions and thoughts have run through the minds of the members of your Medical Advisory Committee as, for the past five years, they have scanned the questionnaires sent in by members of our Society who find themselves in trouble.

We believe that 1941 will be successful in molding the members closer and closer together in harmonious pursuit of the ideal—a lessened number of suits—by a close adherence to common sense, keener judgment and a use of tact and courtesy towards patients and other members of our profession.

Let the study of medical ethics and their promulgation be made a New Year's Resolution. A keener sense of responsibility will be the result.

B. J. B.

NEW WRINKLE

Group insurance is now being written, according to the current issue of *Business Week*, for the trucking company members of a large Chicago motor freight association. The policy covers hospital expense, surgical fees, sickness, and accidents.

This represents a new wrinkle in commercial group insurance. The insurance company agrees to write the insurance at group rates below individual rates for comparable coverage. The employee makes his own decision about buying but if he decides in favor of insurance he gets his own policy and tells his employer to take the premium out of his pay.

Other loosely knit groups of individuals such as drug store chains, the retail hardware association, and the American Institute of Decorators are also arranging for similar group

policies for employes of members, even when the individual member-employer operates only a small business with a limited group of employes.

The development of commercial insurance plans to cover hospital expense and surgical fees has obviously only begun but may reach proportions that will completely eclipse non-profit community experiments in sickness insurance of this type.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary

California "Health Lecturer" Pleads Guilty to Fraudulent Advertising in Minneapolis.

Re. State of Minnesota vs. Stanford Kingsley Claunch.

Stanford Kingsley Claunch, fifty-five years of age, who stated he lived "in California," entered a plea of guilty in the Municipal Court of Minneapolis on October 25, 1940, to a complaint charging him with fraudulent advertising. Claunch was sentenced by the Hon. P. W. Guilford to a straight term of ninety days in the Minneapolis Workhouse, which sentence was suspended on the condition that Claunch refrain from any more activities in the State of Minnesota, and upon the further condition that Claunch leave the State within 4 days.

Claunch was arrested on October 23, 1940, at the Andrews Hotel in Minneapolis, following a joint investigation of his activities by the Minnesota State Board of Medical Examiners, the Hennepin County Attorney's office and the Minneapolis City Attorney's office. Claunch had advertised in the Minneapolis papers that he would give four health lectures at the Brunswick Room of the Andrews Hotel on October 14, 15, 16 and 17. During these health lectures he announced that he was formerly "a practicing naturopathic physician," and "first vice president and director of the American Health Foundation, chartered in Washington, D. C., by the United States Congress." Claunch also announced that he was going to conduct two master courses in Minneapolis, the first one entitled "The Physical Life," and the second one called "The Mental Life." The fee for the first course was \$15.00 and \$10.00 for the second course, or the two courses combined for \$20.00. Claunch professed to his audience that he would have no trouble in treating epilepsy, tuberculosis, diabetes and many other ailments. One of the mistakes made by Claunch was to distribute a circular reading as follows

"THE CLAUNCH SYSTEM OF SCIENTIFIC EATING
Based on the Electrical Energy (Life Force), as Well as the Chemicals, in Food
Is the Only Plan—

That will actually feed illness right out of your body and positive, dynamic health into it. That will eliminate deposits of mucus, pus, acids, drugs and other poisons and at the same time keep up your strength. That will thoroughly nourish your brain and nerves. That will make your skin as soft as velvet and free it from blemishes. That will return your body to normal weight from either extreme. That will completely reshape your body and restore it to its original beautiful form."

Based on the foregoing statement, a complaint was issued by Mr. Joseph A. Hadley, Assistant City Attorney of Minneapolis, charging Claunch with fraudulent advertising. Claunch was immediately arrested and

his bail fixed in the sum of \$200.00, which was not immediately furnished. The following morning Clauch was arraigned in Municipal Court, and despite the fact that he had repeatedly told his audience about his own excellent health, he became very faint in the Court Room and had to lie down. Clauch entered a plea of not guilty and the case was set for trial for October 26. Arrangements were made to have several prominent physicians testify as expert witnesses on behalf of the State in proving the falsity of Clauch's representations. However, Clauch changed his mind about having a trial and entered a plea of guilty.

The Minnesota State Board of Medical Examiners wishes to acknowledge the very splendid coöperation that it received in this case from Mr. Joseph A. Hadley, Assistant City Attorney of Minneapolis, and Captain of Detectives, Clarence E. McClaskey of the Minneapolis Police Department. It should be perfectly obvious that a person who circulates the statements that were made by the defendant in this case, cannot be serving the best interests of the public, and it is encouraging to know that there are public officials who will promptly and effectively act to put a stop to such an imposition upon the public.

Saint Paul Chiropractor Pleads Guilty to Practicing Medicine Without a License

Re. State of Minnesota vs. Edward Ferdinand Jacobson

On November 1, 1940, Edward Ferdinand Jacobson, sixty years of age, entered a plea of guilty in the District Court of Ramsey County, Minnesota, to an information charging him with the crime of practicing medicine without a license. The Honorable Gustavus Loevinger, Judge of the District Court, sentenced Jacobson to pay a fine of \$200.00 or to serve sixty days in the Saint Paul Work-



house. Jacobson paid the fine.

Jacobson was arrested on July 27, 1940, by the Saint Paul Police Department following Jacobson's complaint to the police that a young couple had come to his home and demanded \$300.00 to pay the hospital expense of a 19-year-old Saint Paul divorcee. In the subsequent investigation it was learned that this young lady had gone to Jacobson on July 18, 1940, for what Jacobson described as "delayed menstruation." Jacobson stated that he proceeded to treat her with an electrical device which he inserted in the vagina. The girl subsequently became ill and was taken to a Minneapolis hospital. Upon recovering her health it was reported that the girl again attempted to secure some money from the defendant, ostensibly for the purpose of leaving the city. The defendant stated at the time of his arrest that he had been employed by the Railway Mail Service since 1907, and was receiving \$2,450.00 per year. He stated that he practiced chiropractic in his spare time at 244 Hamm Bldg., Saint Paul, Minnesota. Following his arrest, Jacobson retired from the Railway Mail Service on a pension, and due to the reluctance of the State's chief witness to testify, it was decided to permit the defendant to plead guilty to a charge of practicing medicine without a license. Jacobson was soundly rebuked by the Court for his conduct, the Court stating:

"You have been licensed by the state to practice a particular form of healing. You have not been licensed to practice any other form of healing. When you undertake to perform any other form of healing beyond that which you have been licensed, you are perpetrating a fraud upon your patients as well as violating the law. It is unfortunate that when some people are in physical trouble, when they are ill or have any other physical

difficulty, that instead of going to a person who is qualified to treat them they are likely to go to some person who is more or less of a quack in that particular line. I am not reflecting on your ability as a chiropractor, but on any other line you are just a quack. You have no authority to practice medicine and anyone who pays you any money therefore, pays it to you under false pretense. It is the purpose of the law to discourage that sort of thing so that people with pain and suffering shall not be preyed upon by people who are not qualified to render competent services. Should you attempt to practice any other form of medicine than chiropractic and appear in court again I suspect the court will be considerably less considerate than I think it has been this time."

Saint Paul Woman Sentenced to Two and One-half Year Term for Abortion

Re: State of Minnesota vs. Bertina Stoyke

Following her conviction by a jury in the court of the Honorable James C. Michael, Judge of the District Court of Ramsey County, Mrs. Bertina Stoyke, sixty years of age, was sentenced by the Court to a term of not to exceed two and one-half years in the Women's Reformatory at Shakopee, for the crime of abortion. The defendant was arrested on August 3, 1940, in her home at 723 Fauquier St., Saint Paul, by



police following the removal to a Saint Paul hospital of a twenty-year-old girl who was critically ill following a criminal abortion.

Mrs. Stoyke was arraigned in the Municipal Court of Saint Paul on August 10, at which time she waived a preliminary hearing and was held to the District Court for trial. The defendant's trial commenced on October 14 with the jury returning a verdict of guilty on October 16, following which she was immediately sentenced.

Notwithstanding the fact that the defendant had no medical training or license of any kind, the evidence indicated that she had performed other abortions. Her charge in the present case was \$30. The girl finally recovered and testified for the state. According to the girl, a catheter was used to induce the miscarriage.

The case was personally tried for the State of Minnesota by Mr. James F. Lynch, County Attorney of Ramsey County. Splendid coöperation was received in this case, not only from Mr. Lynch and his staff, but from the Saint Paul Police Department under Chief Clinton A. Hackert.

United States Supreme Court Refuses to Review Five-Year Suspension of Lake City Physician's License

Re. In the Matter of the Revocation of the License of Gottfried Schmidt, M.D.

Re. Gottfried Schmidt vs. Minnesota State Board of Medical Examiners. (Supreme Court of the United States.)

On November 12, 1940, the Supreme Court of the United States announced its refusal to review the case in which the Minnesota State Board of Medical Examiners had suspended for five years, the license of Dr. Gottfried Schmidt of Lake City, Minnesota. Dr. Schmidt's license was suspended on December 16, 1938, following a hearing before the Minnesota State Board of Medical Examiners, during which hearing it was charged that Dr. Schmidt was guilty of immoral, dis-

honorable and unprofessional conduct as defined by law. The testimony at the hearing before the Medical Board disclosed that Dr. Schmidt had attempted to diagnose various ailments, including cancer, tumors, ulcers, and many other serious conditions, by the use of a piece of wood pulp paper moistened with the patient's saliva. The moistened paper was placed on the abdomen of either the patient or a woman subject employed by Dr. Schmidt in his office at Lake City. Dr. Schmidt also represented that he had a machine in his office with which he was able to broadcast to absent patients.

Following the suspension of his license, Dr. Schmidt appealed to the District Court of Ramsey County. After a hearing before Judge Carlton F. McNally, the Court affirmed the action of the Medical Board, holding that the Board's action "was neither arbitrary, oppressive nor unreasonable." Dr. Schmidt then appealed to the Supreme Court of Minnesota, which Court, on May 17, 1940, handed down an unanimous opinion written by Justice Royal A. Stone, affirming the District Court of Ramsey County. Thereafter Dr. Schmidt served notice of appeal to the Supreme Court of the United States.

Dr. Schmidt was born in Minnesota in 1871, and is a graduate in Medicine from the University of Minnesota in the Class of 1903. Dr. Schmidt was represented by Ray E. Lane of Chicago, and John C. Zehnder of Saint Paul. The Minnesota State Board of Medical Examiners was represented by Hon. J. A. A. Burnquist, Attorney General; John A. Weeks, Assistant Attorney General, and F. Manley Brist, all of Saint Paul.

A. M. A. REFUTES PICTURE MAGAZINE STORY

In twenty-four states osteopaths legally can not under any circumstances use drugs.

In eight states by far the greatest number of osteopaths can not use drugs but it is possible for candidates possessing certain qualifications to obtain that right.

In twelve states osteopaths may utilize stated drugs to a limited extent.

Only in five states, probably, may osteopaths use drugs without restriction. Obviously, then, from the standpoint of the right to use drugs, which an osteopath must possess if he is "to practice on equal or almost equal footing with doctors of medicine," the article in *Life* (August 19) is, to put it charitably, indulging in gross exaggeration when it states "In 33 States qualified doctors of osteopathy are permitted to practice on equal or almost equal footing with doctors of medicine."—*From Pittsburgh Medical Bulletin, Sept 7, 1940.*

THEY PREFER TO RIDE

The United States Department of Labor is authority for the interesting observation that Americans in the low and middle income brackets spend far more on care of their automobiles than they do on their health.

Here is what the figures show in a study just completed of consumer purchases by families in the Rocky Mountain and West Central states:

"The upkeep of the family car exceeded the amount of annual medical bills at every income level covered, from \$750 a year to \$5,000 and over. The average family of all the groups surveyed spent about two or three times its sickness costs on motoring. West Central families with annual incomes of from \$1,250 to \$1,499 spent \$151 on automobiles and \$51 on medical care."

In Memoriam

Samuel Scott Blacklock

Dr. Samuel Scott Blacklock was born December 22, 1874, at Vergennes, Jackson County, Illinois.

His preliminary education was obtained at Dixon College, Dixon, Illinois. Later he went to Valpariso College in Indiana, where he received the degrees of B.S. and Ph.G. in 1898. From there he went directly to Rush Medical College in Chicago where he received his M.D. in 1901. In 1902 he came to Hibbing, Minnesota, and joined the Rood Hospital staff, where he became Senior Surgeon, and remained there until his untimely death. In 1908 he went to Vienna for further surgical study.

Dr. Blacklock was a member of the American Medical Association, Fellow of the American College of Surgeons, Minnesota Medical Association and local societies. He was of the Presbyterian faith. He was a Mason and a Shriner, a member of the Kiwanis Club, Mesaba Country Club, Algonquin and the Kitchi Gammi Club. He was married November 14, 1931, to Mrs. Walter Wischgar, who survives him.

Dr. Blacklock was widely known for his surgical and medical ability which was always coupled with sound judgment. He was a loyal friend and a generous giver to any good cause. He will be missed by his many friends, patients, and the entire staff of the hospital where he has labored for thirty-eight years.

Thus has passed in memoria Dr. Samuel Scott Blacklock of the Rood Hospital Staff.

D. C. ROOD AND STAFF.

Henry H. Clark

Dr. Henry H. Clark, who practiced medicine in Edgerton, Minnesota, for twenty years, died October 31, 1940, in Eitel Hospital, Minneapolis. He was seventy-six years old, and had retired from the practice of medicine five years ago.

Dr. Clark was born in Pleasant Grove, New Jersey, June 30, 1864.

He was a member of Elks Lodge No. 443 of Decorah, Iowa, and of the Pipestone County Medical Association.

Survivors include four brothers, two sisters and a nephew.

Maximilian Joseph Kern

Dr. M. J. Kern, for thirty-five years a practitioner in Saint Cloud, Minnesota, died at the age of fifty-nine, August 10, 1940, following a stroke suffered the night before.

Dr. Kern was born in Wadena, Minnesota, March 17, 1881. He took his preliminary studies at Saint John's University, Collegeville, and received his medi-

IN MEMORIAM

cal degree from Creighton University, Omaha, in 1904.

Dr. Kern practiced two years at Freeport and for a short time at Albany before locating in Saint Cloud in 1906. He took some postgraduate work in internal medicine in Vienna soon after locating in Saint Cloud, and upon his return in 1908 became associated with Dr. J. B. Dunn and Dr. C. B. Lewis. He maintained his association with Dr. Lewis until 1927 when he founded the Saint Cloud Clinic. He served as chief roentgenologist at the Saint Cloud Hospital the past seven years.

Dr. Kern was married in 1905 to Anna L. Welle of Freeport. Besides his wife he is survived by the following children: Mrs. John P. Broderick, New York City; Mrs. Paul Borlin, Detroit Lakes; Dr. Max Kern, Freeport; Mrs. Donald Daubanton, Henrietta Eugene, Margaret, and Virginia Mae of Saint Cloud.

Dr. Kern had been a staunch Catholic all his life. Having been educated in Catholic schools he educated all his children in church schools and colleges. He was one of the most generous supporters of his parish church and was known for his interest in the welfare of Saint Cloud and its people. He served one four-year term as a member of the Saint Cloud City Council and was coroner for several years before his death. He was a member of the American Roentgenological Society, the Stearns-Benton Medical Society, and the Minnesota State and American Medical Associations.

Walter List

Dr. Walter List, former superintendent of the Minneapolis General Hospital, passed away recently in Cincinnati, where he had been superintendent of the Jewish Hospital for the past ten years.

He was fifty-four years old.

Joseph Nicholson

Dr. Joseph Nicholson, former Brainerd physician who built the Northwestern hospital there, passed away, November 5, at his home in Los Angeles. Dr. Nicholson was a practicing physician in Brainerd for many years before moving to California more than ten years ago.

His wife and three children survive.

Theodore L. Streukens

Dr. Theodore L. Streukens, 26, a graduate student in the University of Minnesota Medical School, died October 31.

His mother, a sister and four brothers, all of Minneapolis, survive.

Dr. Streukens was born in Staples, Minnesota, November 14, 1913.

Clinton C. Tyrrell

Dr. Clinton C. Tyrrell, a resident of Minneapolis forty years, passed away, October 22, at the family home, 2422 Johnson Street N. E.

Sixty-three years old, Dr. Tyrrell was born in Norfolk, Nebraska, November 3, 1876. He was a graduate of Hamline University and also the University of Minnesota Medical School. During the World War, he was a member of the Medical Reserve Corps, and served as lieutenant commander of the U. S. hospital ship, Sally. He retired from his practice of medicine and surgery in 1928.

Dr. Tyrrell was a member emeritus of the Hennepin County Medical Society.

Survivors include his wife; a daughter, Thyrsa; a brother, Dr. A. H. Tyrrell of California; and a sister, Mrs. L. H. Burch of Everett, Washington.

PRESENT STATUS OF INJECTION TREATMENT OF HERNIA

In September, 1936, the Council on Pharmacy and Chemistry published a report on the injection treatment of hernia based on the replies to a questionnaire which had been addressed to a selected list of hospitals throughout the country. After consideration of the replies the Council concluded that, although there are cases in which this treatment is applicable and effective, nevertheless it should be borne in mind that the attempted cure of hernia by the application of the method of adhesive inflammation is not new; that it had failed to establish itself as a routine method for such treatment and was still in an early experimental stage; further, that physicians who practice this method should realize the dangers from an ethical, a legal and a financial point of view. To keep the Council's information up-to-date on this subject, the same questionnaire was again addressed to those hospitals which formerly replied. After due consideration of the second hospital survey and the reports in the recent literature, the Council voted to adopt this report to reaffirm its previous opinion that the injection method of treating hernia may not be recognized for general use and should be employed only by those with special experience and with full cognizance of the dangers involved in the use of such solutions. The Council now concurs in the opinion that the method involves less danger of serious complications than surgery when employed only in selected cases of hernia by those skilled in the injection of suitable standardized solutions of known composition and action. The Council is not, however, willing to recognize any such solutions for New and Nonofficial Remedies until sufficient follow-up experience in their application has been gained to establish the success of the injection method of treatment. Present evidence indicates that better types of solution are to be desired. (J.A.M.A., Aug. 17, 1940, p. 533.)

OF GENERAL INTEREST

Twin daughters were born to Dr. and Mrs. Douglas P. Head, October 28.

* * *

Dr. and Mrs. Jerome A. Hilger of Saint Paul are the parents of a son, Michael, born October 13.

* * *

Dr. and Mrs. Wesley W. Spink of Minneapolis announce the birth of a daughter, Helen Gayden, November 12.

* * *

Dr. Reuben F. Erickson of Minneapolis was elected to the House of Representatives from the Thirty-sixth district, South Half, at the recent election.

* * *

Notice—The University of Minnesota library desires back issues of MINNESOTA MEDICINE, separate or bound. Volume 2, No. 7, is especially desired.

* * *

Dr. Arnold E. Naegeli, Saint Paul, married October 31, 1940, Miss Audrey Elinor Miller at Toronto, Canada.

* * *

Dr. Karl Lind, who has held a National Cancer fellowship at the University of Minnesota, has gone to Washington, D. C., to take a governmental position as pathologist in the National Institute of Health.

* * *

Dr. Rigler also presented a paper at the meeting of the American Roentgen Ray Society, which met in Boston in October. Title of the paper was "Roentgen Kymography in Constrictive Pericarditis."

* * *

Dr. R. E. Fricke of Rochester is the newly elected president of the Rochester Kiwanis Club. Dr. H. E. Essex has been named to the board of directors for a two-year term.

* * *

Dr. W. D. Beadie, superintendent of the Mineral Springs Sanatorium at Cannon Falls for the past twenty years, has resigned his position because of ill health. His resignation will be effective January 1.

* * *

Dr. W. F. Braasch of Rochester was recently made a corresponding member of the Sociedad Venezolana de Urologia, in Venezuela, and of the Sociedad Cubana de Urologia, in Cuba.

* * *

Dr. John D. B. Galloway has opened an office at 1251 Medical Arts Building in Minneapolis. He will limit his practice to orthopedics. Dr. Galloway was a Fellow in the Mayo Foundation from 1936-39.

* * *

Dr. H. J. Kurtin of Blooming Prairie and Miss Isabella Shimota of Lonsdale were married November 16. Dr. Kurtin, who opened his office in Blooming Prairie last summer, practiced two years in Lonsdale before going to Blooming Prairie.

Dr. George S. Bergh announces the opening of offices for the practice of general surgery at 1635 Medical Arts Building, Minneapolis. Dr. Bergh is a clinical instructor at the University of Minnesota Medical School.

* * *

Dr. Robert R. Tracht announces the opening of offices at 404 Lowry Medical Arts Building, Saint Paul. He is specializing in the care of the eye. Dr. Tracht is a clinical instructor in refraction at the University of Minnesota Medical School.

* * *

Dr. John T. Kometani announces the opening of his office for the general practice of medicine at 2124 South King street in Honolulu, Hawaii. Dr. Kometani was an intern in the University of Minnesota Hospitals last year.

* * *

Governor Harold E. Stassen has announced the re-appointment of two physicians to the Minnesota State Board of Medical Examiners. They are Dr. F. H. Magney of Duluth, who will serve until 1946, and Dr. Albert Fritsche of New Ulm, until 1947.

* * *

A recent visitor at the University of Minnesota Hospitals was Dr. O. P. Pedroso of Sao Paulo, Brazil. Dr. Pedroso, who is visiting hospitals and clinics in this country, studying hospital administration, will become superintendent of the Sao Paulo Hospital in Sao Paulo on his return to Brazil.

* * *

Dr. W. W. Yaeger of Marshall has purchased the facilities of the Cowin Hospital, it is announced, and has renamed it the Anna Maria Memorial Hospital in memory of his mother. The hospital has ten beds and four bassinets. Dr. Yaeger will continue to maintain his office above the Sward-Kemp drug store.

* * *

Dr. A. C. Kelly, who has been an assistant to Dr. E. K. Rowles at the Rood Hospital in Coleraine for several months, has gone to Duluth to take over the practice of Dr. Roy Mayne. Dr. Mayne, a reserve officer in the United States Navy, has been called to active duty.

* * *

Dr. William C. Bernstein of Minneapolis, who is doing graduate work in proctology at the University of Minnesota Medical School, will go to California about the twentieth of January to spend six weeks as a clinic guest of Dr. Dudley Smith of San Francisco.

* * *

Dr. Jennings C. Litzberg presided at the October meeting of the Central Society of Obstetrics and Gynecology held in Indianapolis. Dr. Litzberg's presidential address was "Continuation Study in Medical Education" based on methods of graduate education at the University.

OF GENERAL INTEREST

Dr. Hymer Friedell, who received his Ph.D. degree in radiology at the University of Minnesota in June, has been studying with Dr. Max Cutler and his associates at the Tumor Clinic in Chicago. He plans to spend the next six months at the Memorial Hospital in New York and then go to San Francisco to be with the radiologist, Robert Spencer Stone.

* * *

Dr. Elmer L. Sevringhaus of Madison, Wisconsin, professor of medicine at the University of Wisconsin Medical School, was convocation speaker at the University of Minnesota, November 28. The subject of his illustrated talk was "Meet Your Endocrine Glands."

* * *

Dr. Leo G. Rigler, professor of radiology at the University of Minnesota Medical School, read a paper at the meeting of the Radiological Society of North America, which met in Cleveland, Ohio, December 2-6. The paper, prepared by himself and Dr. Curtis Nessa of the University of Minnesota was entitled, "Roentgen Findings in Pulmonary Edema."

* * *

Dr. Walter Boothby and Dr. W. Randolph Lovelace, II, of the Mayo Clinic, and Captain Harry Armstrong of the United States Army Medical Corps were awarded the Collier trophy this year for their research work in connection with low atmospheric pressure affects on airplane pilots. The trophy has been presented annually since 1911.

* * *

Dr. Edward M. Baldigo of Red Wing and Miss Marcia Draves of Milwaukee were married, October 19, and are now at home in Red Wing, where Dr. Baldigo recently became associated with Dr. Donald R. Claydon and Dr. L. E. Claydon. Dr. Baldigo is a graduate of the University of Minnesota Medical School.

* * *

Dr. Wallace H. Cole of Saint Paul, director of the Division of Orthopedic Surgery at the University of Minnesota Medical School, will leave for England the latter part of December to replace Dr. Philip Wilson as director of the American Hospital in Britain.

Dr. W. T. Wenner of Saint Cloud announces the association of Dr. J. J. Prendergast, formerly of Saint Paul.

* * *

Dr. Philip S. Hench of Rochester was awarded an honorary doctor of science degree by Washington and Jefferson College in Washington, Pennsylvania, October 26. He participated in the dedication program of the Lazear Memorial Building there.

Last month, Dr. Hench addressed several medical meetings in the East. He spoke before the Delaware Academy of Medicine in Wilmington, November 8; and attended a meeting of the executive committee of the American Rheumatism Association in New York, November 9.

Before returning, he spoke in Champaign, Illinois, at a meeting of the County medical society there.

Dr. Robert Rosenthal of Saint Paul had an interesting pediatrics exhibit at a tea given at the Children's Hospital in Saint Paul for nurses attending the recent state meeting. The exhibit included pictures showing the history of vaccination; pictures portraying the development of lying-in rooms, as well as a miniature lying-in room; a collection showing the development of nursing bottles and other feeding devices.

* * *

The offices of Jolin, Jolin and McKenna in Bovey have been modernized and enlarged. New equipment includes a shock-proof x-ray machine, quartz lamp, basal metabolism equipment and electrocardiograph.

Physicians in the firm include Dr. F. M. Jolin of Coleraine; Dr. M. J. McKenna and Dr. R. V. Jolin of Grand Rapids. It is planned to add another physician to the staff.

* * *

Dr. Cecil J. Watson, professor of medicine and director of the Division of Internal Medicine at the University of Minnesota Medical School, spoke before the Central Society of Clinical Research in Chicago, November 2, on "Variations in Clinical and Chemical Findings in Three Cases of Acute Zinc Porphyrin."

He will speak before the National Gastro-enterological Society in New York City, April 21.

* * *

Dr. W. A. O'Brien of the University of Minnesota Medical School spoke at a special postgraduate course on recent advancements in medicine, sponsored by the Medical Society of Milwaukee County, in Milwaukee, October 29. His subject was "Pathology of the Infant." An unusual feature of this society's meetings is "Fifteen Minutes of Preventive Medicine" which is a part of every program.

* * *

Dr. Joseph B. Gaida, eye, ear, nose and throat specialist, announces the opening of new offices at 207 St. Mary's Building, St. Cloud. Dr. Gaida has been practicing in St. Cloud for more than eight years, being associated with the late Dr. John Gelz and Dr. W. T. Wenner for five years. Since Dr. Gelz' death more than three years ago, he has been associated with Dr. Wenner.

* * *

Dr. Conrad A. Elvehjem, director of the department of biochemistry at the University of Wisconsin, presented the first Minnesota Medical Foundation Lecture at the University of Minnesota Medical School, November 12. Dr. Elvehjem's topic was "The Biochemistry of the Vitamin B Complex." He also spoke on "Vitamins and Nutrition" at a meeting of the Hennepin County Medical Society, November 13.

* * *

As the result of competitive examinations held in July, three Reserve Officers in Minnesota have been appointed as first lieutenants in the Medical Corps of the Regular Army:

Dr. William H. Cleveland of Rochester, Minnesota, a graduate of the Northwestern University Medical School; Dr. John N. Furst of Hallock, Minnesota, and Dr. R. A. Lawn of Minneapolis, graduates of the University of Minnesota Medical School.

OF GENERAL INTEREST

Dr. Wesley W. Spink, assistant professor of medicine at the University of Minnesota Medical School, has received a grant-in-aid from the Committee on Scientific Research of the American Medical Association to support an investigation of antistaphylococcal immunity and the nutritional requirements of staphylococci.

Dr. Spink has also received a grant from Merck and Company in support of a study of ascorbic acid and its relation to the immune mechanism.

* * *

Dr. Henry W. Woltman of Rochester, a member of the committee on research for the prevention and treatment of after-effects for the National Foundation for Infantile Paralysis, attended the first medical meeting to be devoted entirely to the disease in New York, November 7 and 8. Dr. M. S. Henderson of Rochester is also a member of the Foundation's research committee.

* * *

Presiding at the twenty-first annual meeting of the American Student Health Association when it convenes in Ann Arbor, Michigan, December 27 and 28, will be Dr. Ruth E. Boynton of Minneapolis, association president, and director of the University of Minnesota Student Health Service.

Dr. Boynton will give the president's address at the convention, which will have a "Coming of Age" theme. A highlight of the program will be the dedication of the new University of Michigan student health service.

* * *

Words of praise on the University of Minnesota Medical School's Fiftieth Anniversary Volume, "Chemistry and Medicine," appeared in the October 12 issue of *The Lancet* published in London.

The article, in part, follows:

"There could be no more eloquent testimony to the value of chemistry than the volume of papers presented at the fiftieth anniversary of the founding of the Medical School of the University of Minnesota. Under the editorship of Professor Maurice B. Visscher reviews are published in physical chemistry in medicine, investigations in metabolism, aspects of immunity and chemotherapy, and the nervous control of the organism. The writers are men who have earned recognition as researchers, and they present their own work in proper perspective against a background of selected literature."

* * *

Three medical continuation courses were conducted at the University of Minnesota Center for Continuation Study last month.

Twenty-two physicians registered for the course in *General Surgery*, November 4-9, at which Dr. Edward William Alton Ochsner, Professor of surgery at the Tulane University of Louisiana School of Medicine, was the visiting member of the faculty. The registrants were:

Drs. R. J. Wilkowske, Owatonna; Leslie A. Moren, Saint Paul; Arnold Larson, Detroit Lakes; F. Paul Kortsch, Prior Lake, and Harold W. Havel of Jordan, all Minnesotans; John I. Appleby, Bellevue, Ohio; John F. Sparks, Kingston, Ontario Canada; Maurice L. Whalen, Bruce, Wisconsin; H. T. Skovholt, Williston, North Dakota; Paul Reed, Rolla, North Dakota; T. P. Ranney, Aberdeen, South Dakota; Arthur J. Offerman, Omaha, Nebraska; Charles I. Meredith, Valley City, North Dakota; D. S. MacKenzie Jr., Havre, Montana; Everett H. Lindstrom, Helena, Montana; Harvey L. Jorgenson, Marinette, Wisconsin; Elmer N. Hunter, Detroit, Michigan; W. Max Gentry, Gering, Nebraska; Clarence E. Crook, Lincoln, Nebraska; Julius Bloom, Woodville, Wisconsin; M. A. Blackstone, Sioux City, Iowa; and Ellis E. Baker, Scottsbluff, Nebraska.

The Committee on Public Education of the American Psychiatric Association, of which Dr. C. Charles Burlingame is chairman, has organized the country into twelve regional districts, each to have a regional chairman who will have charge of disseminating sound psychiatric information especially suited to each district. An important phase of the committee's work will be to make known the Association's advocacy of better hospital standards for psychopathic patients.

Dr. Ralph C. Hamill, Chicago, is chairman of the district which includes Illinois, Michigan, Wisconsin, Iowa, Nebraska and Minnesota. Dr. Hamill has specialized in psychiatry since 1909, and since 1921 has been with the Public Health Department of the United States and with the Veteran's Bureau.

* * *

Hundreds of his friends from Randall, Minnesota, and the surrounding area honored Dr. Samuel G. Knight and his family at a community gathering, November 9, in celebration of Dr. Knight's thirty years of service to the Randall community.

A large gold key to the village, in whose affairs Dr. Knight has been active, was presented by little Jean Marie Hegg. Dr. Knight has been mayor of Randall, a member of the school board and of the Boy Scout board.

As an expression of the community's appreciation, a purse was also presented to the honored guests. Mrs. Knight was given a bouquet of flowers by the Civic League.

Among the congratulatory telegrams read was one from Dr. Allen Dafoe, a classmate of Dr. Knight.

Attending the event, which was a double celebration inasmuch as Dr. and Mrs. Knight noted their twenty-seventh wedding anniversary November 5, were their three children: Dr. Edwin Knight of Minneapolis, an intern at General Hospital in Minneapolis; Robert, University of Minnesota student; and Mrs. Virgil Miller of Randall.

* * *

Scheduled to speak at meetings of the Medical Guild of St. Luke of the Newman Foundation at the University of Minnesota this year are several prominent physicians.

Lt. Col. Quigley will address the December meeting on the subject, "Medicine and the United States Army"; Dr. Charles E. Rea, January, "Interesting Figures in the History of Surgery"; Dr. Raymond Bieter, February, "Catholic Scientists in America"; Dr. Thomas Kinsella, March, "Chest Surgery"; Dr. William E. Peyton, April, "Brain Tumors and Brain Surgery."

Drs. L. F. Richdorf and John F. Fohl spoke at the October meeting on "Poliomyelitis"; and Dr. William A. O'Brien, November, "Medical Ethics."

The guild is made up of approximately 60 medical students, 20 medical technologists, 25 pre-medical students and 40 alumni medical practitioners. Dr. Bieter is faculty advisor.

Gerald Taylor, senior in the Medical School, heads the organization. Members of the board include Austin McCarthy of Watkins, Robert Delmore of Roseau, Laurence Thouin of Hibbing, Thomas Glynn and John Hays of Saint Paul.

OF GENERAL INTEREST

Among medical reserve officers ordered to active duty in the United States Army by commanding general, Seventh Corps Area, up to November 8, are the following Minnesotans:

Major Frederic Stuart Richardson, Minneapolis, The Executive, First Military Area, Minneapolis.

Captain Henry Irvin Yaffe, Minneapolis, Commanding General, Fort Snelling.

Captain Walter David Coddon, Saint Paul, Commanding General, Fort Snelling.

Also the following First Lieutenants: Dr. Philip Rains Beckjord, Willmar; Dr. Lester Sanford Frogner, Grand Marais; Dr. George Waltermann, Holt, Wabasha; Dr. Ronald Walter Steube, Saint Paul; Dr. Gunnar Linner, Minneapolis; Dr. Frederick Gunnar Gunlaugson, Mankato, all assigned Commanding General, Fort Snelling.

Dr. Burton Piper Grimes of Saint Peter, first lieutenant, has been assigned Commanding General at Fort Benning, Georgia. Dr. Grimes, the son of Dr. and Mrs. H. B. Grimes of Madelia, has been a member of the staff at the State Hospital in Saint Peter for the past two and a half years.

Naval medical reserve officers assigned to active duty include:

Dr. Lawrence M. Larson, lieutenant, Minneapolis, to N.R. A.B., Minneapolis.

Dr. John A. C. Leland, lieutenant, Minneapolis, to N.H. Mare Island, California.

Dr. N. H. Lufkin, lieutenant, Minneapolis, to 18th Bn., Saint Paul.

Dr. Roy Malone Mayne, lieutenant commander, Duluth, assigned to the U.S.S. Paducah.

Dr. Donald McCarthy, lieutenant commander, Minneapolis, assigned to N.R.S. Minneapolis.

Dr. Frank F. Wildebush, lieutenant, Minneapolis, to Naval Mobile Hospital No. 1.

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Of the 114 members of the freshmen class admitted to the University of Minnesota Medical School this fall, twenty-one are sons or daughters of physicians.

They include:

Donald E. Bergan, son of Dr. Otto Bergan (U. of M. '12), Clinton, Minnesota; Catherine Burns, Albert Lea, daughter of the late Dr. H. D. Burns; Kenneth W. Covey, Bagley, Minnesota, son of Dr. W. C. Covey; Ralph L. Estrem, son of Dr. C. O. Estrem, Fergus Falls (U. of M. '07); Jack D. Ewing, son of Dr. B. F. Ewing, Omaha, Nebraska.

Also John George Freeman, St. Peter, son of Dr. George H. Freeman (U. of M. '05); Alice H. Gamble, daughter of Dr. Joseph W. Gamble (U. of M. '18), Albert Lea, Minnesota; Neill F. Goltz, son of Dr. E. V. Goltz, Saint Paul; Edward D. Henderson, son of Dr. Melvin S. Henderson, Rochester; Douglas Raymond Kusske, son of Dr. Arthur L. Kusske, New Ulm; Robert Elkon Litman, son of Dr. M. H. Litman, Minneapolis.

Also, Martin A. Nordland, son of Dr. Martin Nordland, Minneapolis (U. of M. '13); Robert J. Petters, son of Dr. F. H. Petters with the United States Army at Cristobal, Canal Zone; Norris S. Rothnem, son of Dr. T. P. Rothnem (U. of M. '12), Fargo, North Dakota; David John Sanderson, son of Dr. A. G. Sanderson, Granite Falls; Marvin J. Shapiro, son of Dr. M. J. Shapiro (U. of M. '17); Helene M. Templeton, daughter of Dr. E. W. Templeton, Seattle, Washington; Robert H. Vadheim, son of Dr. A. L. Vadheim (U. of M. '09), Tyler, Minnesota; Robert M. Watson, son of Dr. A. M. Watson, Royalton, Minnesota.

Also John E. Withrow, son of Dr. Morrill E. Withrow, International Falls; Thomas D. Wright, Minneapolis, son of the late Dr. C. B. Wright.

The class is made up of 102 residents of Minnesota, and twelve residents of other states.

Nine of the class are women, four of them daughters of physicians. Seventeen are doctors' sons.

Forty-three had an average of "B" or better in their premedical work, and the whole class had an average of 1.88 honor points per credit hour ("B minus") in college, a fact which should augur well for their success in medical school.

Dr. Harold S. Diehl, dean of the Medical School of the University of Minnesota, has been appointed a member of the sub-committee on Medical Education of the Health and Medical Committee of the National Defense Council.

The general Health and Medical Committee was appointed by President Roosevelt on September 19 to survey and coördinate the medical resources of the country in the interests of national defense. This committee is composed of Dr. Irvin Abell of Louisville, Kentucky; General James C. Magee, Surgeon General of the Army; Rear Admiral Ross T. McIntyre, Surgeon General of the Navy; Dr. Thomas Parran, Surgeon General of the United States Public Health Service; and Dr. Lewis H. Weed, chairman of the Division of Medical Sciences of the National Research Council.

* * *

Dr. Edith L. Potter, instructor and pathologist at the Chicago Lying-In Hospital, University of Chicago, was a visiting member of the faculty for the course in *Obstetrics*, November 11-16.

Registrants for this course were:

From North Dakota: Drs. L. Almklov, Cooperstown; John P. Bartle, Langdon; W. E. Blatherwick, Van Hook; William Campbell, Valley City; William H. Cuthbert, Hillsboro; C. R. DuKart, Richardton; Arnold J. Gumper, Dickinson; Simon W. Hill, Regent; B. J. Hughes, Rolla; G. Wilson Hunter, Fargo; John B. James, Page; P. O. C. Johnson, Watford City; H. A. LeFleur, Lakota; V. H. Moats, McClusky; A. F. Panek, Milton; Albert H. Reiswig, Wahpeton; E. H. Richter, Hunter; Carl I. Rollefson, Crosby; Norman J. Rose, Finley; Samuel I. Rothman, Belcourt; E. J. Schwinghamer, New Rockford; John Simon, Napoleon; Felix F. Vonnegut, Hague; A. J. Welker, Max; Floyd E. Wolfe, Oakes; and C. E. Reynolds, Strasburg.

From Minnesota: Drs. Melvin L. Hovland, Minneapolis; H. C. Otto, Frazee; Benjamin J. Singer, Saint Paul.

From South Dakota: Drs. Julius Mueller, Flandreau; Hugo C. Andre, Vermilion; John Edward Curtis, Lemon; Magin Davidson, Brookings; John H. Davis, Belle Fourche; Louis C. Dick, Spencer; F. Daniels Gillis, Mitchell; David A. Gregory, Milbank; Ernest J. Hofer, Freeman; N. K. Hopkins, Arlington; R. E. Jerntrom, Rapid City; M. W. Larsen, Watertown; C. L. Olson, McIntosh; A. W. Pearson, Sisseton; R. J. Quinn, Burke; K. E. Sherman, Sturgis; H. P. Volin, Lennox; John W. Bushnell, Elk Point; Hazel Lamb, Sioux Falls.

From Wisconsin: Drs. Walter C. Andrews, Frederic; John J. Boersma, Sheboygan; Raymond T. Shima, Turtle Lake.

Other registrants were: Drs. Marjorie R. Bennett, Winnipeg, Manitoba, Canada; M. A. Currie, Regina, Saskatchewan, Canada; Elma M. Howard, Miles City, Montana; Frederick F. Kumm, St. Petersburg, Florida; Draper Long, Mason City, Iowa; Charlotte P. Seiver, Fremont, Nebraska.

Visiting member of the faculty for the course in *Proctology*, November 11 to 16, was Dr. Frank Clark Yeomans, professor of proctology, New York Polyclinic Medical School and Hospital, New York City.

Physicians who attended this course were:

Drs. A. D. Hoidale, Tracy; W. G. Johanson, St. Paul; Mellvin E. Lenander, St. Peter; Harvey T. Petrahorg, Aitkin, and Charles B. Will, Bertha, Minnesota.

From Iowa: Drs. M. G. Bourne, Algona; Olin A. Elliott, Des Moines; Jay E. Houlahan, Mason City; Clarence E. Lynn, Dubuque; Carroll C. Nelson, Red Oak, and Glen E. Snyder, Grimes.

From Wisconsin: Drs. Philip J. Eisenberg and Leonard J. Schwade, Milwaukee; A. L. Schemmer, Colby, and Woodruff Smith, Ladysmith.

Others were: Drs. F. H. Lowe and John Paul Ritchey, Missoula, Montana; and Erwin E. Stephens, Eureka, South Dakota.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR DECEMBER

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

December 7—Otitis Media

December 14—Cause of Hearing Loss

December 21—When Deafness Comes

December 28—Modern Scientific Achievements

AMERICAN ACADEMY OF DERMATOLOGY AND SYPHILOLOGY

The Academy meets at the Palmer House, Chicago, December 8, 9, 10 and 11, 1940. Some sixty lectures are scheduled and, in addition, numerous round-table discussions and clinics at the University of Illinois Medical School.

Dr. Harry R. Forester, Milwaukee, is president and Dr. Earl D. Osborne, Buffalo, secretary of the Academy.

CONGRESS OF INDUSTRIAL HEALTH

The third annual Congress of Industrial Health, sponsored by the Council on Industrial Health of the American Medical Association, to be held at the Palmer House in Chicago, January 13 and 14, merits the special attention of industrial surgeons throughout the country at this time, particularly with the speeding in industry and with added importance to the saving of man-hours.

The two-day program will be devoted to subjects such as hand and eye injury, acute respiratory disease and preventive medicine as applied to industry.

The probable need for the use of the physically handicapped to replace those more able-bodied, who will be inducted into the service, will receive consideration.

Sickness and accident prevention and rapid rehabilitation of those injured are subjects of growing importance in the national economy.

JOHN W. BELL LECTURE

"Manifestations of Tuberculosis in the Silicotic Subject" was the subject of the John W. Bell Tuberculosis Lecture before the Hennepin County Medical Society in the society's rooms, Medical Arts Building, December 2.

The lecture was delivered by Dr. Leroy U. Gardner of Saranac Lake, New York, director of the Trudeau Foundation of the Trudeau Sanatorium and the Saranac Laboratory for the Study of Tuberculosis. For the past twenty years, Dr. Gardner has supervised the

work of the Saranac Laboratory in its study of industrial diseases of the lungs. He is a member of the Council on Industrial Health of the American Medical Association.

The John W. Bell Tuberculosis Lectureship in the Hennepin County Medical Society was established and is maintained by the Hennepin County Tuberculosis Association.

CONTINUATION COURSES

The University of Minnesota announces the winter schedule of continuation hospital and medical courses, as follows:

January 2-4—Problems of Executive Housekeepers (for representatives of hotels, hospitals, and institutions)

January 20-25—Ophthalmology (for ophthalmologists and otolaryngologists)

January 27-February 1—Hospital Administration

February 3-5—Uterine Bleeding (for gynecologists and radiologists)

February 13-15—Medical Social Service

February 20-22—Dietetics (for dietitians)

March 3-5—Internal Medicine

March 6-8—Obstetric and Pediatric Nursing

The sessions will be conducted at the Center for Continuation Study which also provides living accommodations for those who attend the courses at an average rate of \$1.25 a day for room and \$1.50 a day for meals. Tuition varies from \$5 to \$10 for hospital courses and \$15 to \$25 for medical courses. For further information, address Director, Center for Continuation Study, University of Minnesota, Minneapolis, Minnesota.

OPHTHALMOLOGY-OTOLARYNGOLOGY COURSE

A special course for ophthalmologists and otolaryngologists will be conducted at the Center for Continuation Study at the University of Minnesota, January 20-25, 1941.

Guest lecturers will include Dr. Ramon Castroviejo of the Ophthalmic Institute of New York City; Dr. Albert D. Ruedemann of the Cleveland Clinic, Cleveland, Ohio; Dr. Derrick T. Vail, professor of ophthalmology at the University of Cincinnati College of Medicine, Cincinnati, Ohio; Dr. Thomas D. Allen and Dr. Robert Von der Heydt, associate clinical professors of ophthalmology, Rush Medical College, University of Chicago.

Other members of the faculty will be members of the ophthalmology and otolaryngology department of the University of Minnesota Medical School and the Mayo Foundation, and also the anatomy, radiology departments, the division of neuropsychiatry, and of the anesthesiology department.

MINNESOTA PATHOLOGICAL SOCIETY

The Minnesota Pathological Society will be addressed by Dr. H. P. Smith of the Department of Pathology, University of Iowa, Iowa City, December 17. Title of Dr. Smith's talk will be "The Coagulation of Blood

with Special Reference to Vitamin K Therapy," according to Dr. E. T. Bell of the University of Minnesota, secretary of the society.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

Dr. Max H. Hoffman of Saint Paul was elected president of the Minnesota Society of Internal Medicine at a meeting in Rochester, November 11. He succeeds Dr. Russell M. Wilder of Rochester.

Named vice president was Dr. Cecil J. Watson of Minneapolis. Dr. Reuben A. Johnson of Minneapolis was re-elected secretary-treasurer.

New members elected were: Dr. J. Allen Wilson of Saint Paul, Dr. Philip Hallock of Minneapolis, and Dr. T. J. Dry of Rochester.

Program chairman for the meeting was Dr. B. T. Horton of Rochester.

Papers were presented by Dr. Thomas Ziskin of Minneapolis; Dr. A. R. MacLean and Dr. E. V. Allen of Rochester; Dr. H. E. Essex of Rochester; Dr. Max H. Hoffman of Saint Paul; Dr. E. L. Tuohy of Duluth. Other papers were by the following Rochester men: Dr. Robert Woods and Dr. A. B. Barnes; Dr. L. E. Prickman and Dr. H. J. Moersch; Dr. E. C. Kendall; Dr. H. F. Helmholtz; Drs. C. R. Maino, B. E. Hall and H. Z. Giffin.

Principal speaker at the banquet was Dr. Irvine McQuarrie of the University of Minnesota, who held a visiting professorship in pediatrics in Peiping, China, early this year. He spoke on his experience in China, and discussed political, military and health problems of occupied North China.

On account of the blizzard, most out-of-town members attending were unable to return to their homes until the 13th.

The next meeting of the society will be held in Minneapolis in the spring.

MEEKER COUNTY TUBERCULOSIS CONTROL DEMONSTRATION

Plans for the Meeker County Tuberculosis Control Demonstration were discussed at a meeting held in Litchfield, November 7, by members of the committee on tuberculosis of the Minnesota State Medical Association and the physicians of Meeker county and adjoining counties. As previously announced, the committee has selected Meeker county for a three to five year demonstration of modern control methods. This was the second meeting held in Litchfield and a third is scheduled for December 5.

Members of the state committee attending were: Drs. B. S. Adams of Hibbing, president of the Minnesota State Medical Association; B. J. Branton of Willmar, president-elect of the Association; J. A. Myers, Minneapolis, professor of medicine, University of Minnesota, chairman of the Tuberculosis Committee of the Minnesota State Medical Association; E. A. Meyerding, Saint Paul, executive secretary of the Minnesota Public Health Association; C. A. Stewart of Minneapolis, one of the councillors of the Medical

Association; S. A. Slater, medical superintendent of Southwestern Sanatorium, Worthington; K. H. Pfuete, assistant medical director of Mineral Springs Sanatorium, Cannon Falls; C. A. Scofield, Benson, former president of the Minnesota Department of Health; H. A. Burns, superintendent of the Minnesota State Sanatorium, Ah-Gwah-Ching; and Arthur J. G. Henderson of Kiester.

MINNESOTA SOCIETY OF OBSTETRICS AND GYNECOLOGY

The Minnesota Society of Obstetrics and Gynecology will meet Saturday, December 14, at the Kitchi Gammi Club in Duluth. The program for the one-day session will include the following papers:

- "Actinomycosis of the Ovary"—W. A. Coventry, M.D., Duluth.
- "Stilbestrol"—L. M. Randall, M.D., Rochester.
- "Evaluation of Serologic Tests in Pregnancy and During Menstruation"—F. T. Becker, M.D., Duluth.
- "Alar Scapulæ"—M. H. Tibbets, M.D., Duluth.
- "A Case of Severe Dysmenorrhea and Sterility Effectively Treated With Pranone"—C. J. Ehrenberg, M.D., Minneapolis.
- "Certain Pulmonary Complications in Parturition and Pregnancy"—F. J. Hirschboeck, M.D., Duluth.
- Vitamin "C" Deficiency in Pregnancy"—A. L. Dippel, M.D., Minneapolis.
- "Intravenous Use of Ergotrate in the Third State of Labor"—J. R. Manley, M.D., Duluth.

Dr. J. C. Masson of Rochester is president of the society, and Dr. E. C. Hartley of Saint Paul, secretary.

BLUE EARTH VALLEY MEDICAL SOCIETY

Dr. P. W. Demo of Wells is the newly elected president of the Blue Earth Valley Medical Society. He succeeds Dr. V. M. Vaughan of Truman. Other officers are Dr. J. J. Heimark of Fairmont, vice president; Dr. J. L. Mills of Winnebago, secretary-treasurer. Dr. A. W. Sommer of Elmore was elected a trustee.

Dr. W. C. Chambers of Blue Earth was named a delegate to the state medical convention; and Dr. R. C. Hunt of Fairmont, alternate.

New members accepted into the society are Dr. D. G. McMillen of Triumph, Dr. Robert Hunt of Fairmont, and Dr. Ralph Parsons of Monterey.

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Dr. B. E. Hempstead of Rochester was elected president of the Olmsted-Houston-Fillmore-Dodge County Medical Society at the organization's annual meeting in Rochester, November 6. Dr. C. B. McKaig of Pine Island was named vice president, and Dr. M. J. Anderson of Rochester was re-elected secretary and treasurer.

Eleven delegates and alternates were chosen for the annual state convention.

Delegates are Drs. H. R. Baker of Hayfield, H. Paul Johnson of Harmony, J. W. Helland of Spring Grove, C. B. McKaig of Pine Island, and J. E. Crewe, M. C. Piper, N. W. Barker, A. H. Sanford, M. J. Anderson, Waltman W. Walters and L. A. Buie of Rochester.

Alternates are Drs. J. P. Nehring of Preston, G. E. Olson of West Concord, E. A. Olson of Pine Island,

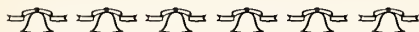
N. E. Anderson of Harmony, W. W. Canfield of Houston, Claude W. Woodruff of Chatfield, and J. D. Camp, J. A. Paulson, J. M. Berkman, G. L. Joyce and H. C. Haben of Rochester.

Besides the business meeting, there was a symposium on first aid at accidents for the casually present physician. Dr. J. S. Lundy discussed "Poisoning; Shock by Electricity; Artificial Respiration." Snake bite treatment was discussed by Dr. J. W. Pender. Other speakers were Dr. E. B. Tuohy, "Control of Bleeding;" Dr. A. W. Adson, "Head Injuries;" Dr. R. D. Mussey, "Accidents to Pregnant Women;" Dr. G. B. New, "Injuries to the Face" and A. J. Lobb, "Legal Advice: Responsibilities that a Physician Would Incur When He Steps in to Give First Aid at Scene of Accident."

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The Southwestern Minnesota Medical Society, meeting in Worthington, elected Dr. W. G. Benjamin of Pipestone, president; Dr. P. W. Harrison of Worthington, president-elect; Dr. H. Basinger of Windom, vice president; and Dr. B. O. Mork of Worthington, secretary-treasurer.

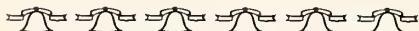
Dr. S. A. Slater of Worthington and Dr. Benjamin were named delegates to the Minnesota State Medical Association meeting.



CHRISTMAS SEALS



Help to Protect Your Home from Tuberculosis



WOMAN'S AUXILIARY

MRS. M. A. NICHOLSON, Duluth, Minnesota, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

We have received an urgent plea from our National President Mrs. V. E. Holcombe as follows:

"Subscribe to the Bulletin, the official publication of the Woman's Auxiliary to the American Medical Association; issued quarterly, \$1 a year. Send subscriptions to Mrs. H. E. Christenberry, Highland Drive, Knoxville, Tennessee."

And from Mrs. George H. Ewell, Editor of the Bulletin, the following message:

"The Woman's Auxiliary of the American Medical Association is making a special effort at this time to awaken wide-spread interest in its activities, by increasing the number of readers of the *Bulletin*.

"This little booklet is a successor to the *News Letter* which for many years has kept the officers and board members acquainted with the progress of the Auxiliaries of all the States. It is published quarterly and contains reports of conventions, places of work, inspirational messages from leaders, and news of the hour in the medical world. It is a great help in promoting interest in local auxiliaries, especially where the program is new.

"The fall issue contains the inaugural address of Mrs. V. E. Holcombe, the National Auxiliary president. Also a message to women from Dr. Van Etten, president of the American Medical Association. Many other interesting items are to be found within its forty pages. It is hoped to have 6,000 women, one-fourth of the membership, reading the *Bulletin* before the year is over. In this way the members may keep abreast of the trends in the medical world and be better able to function as members and leaders of the Auxiliaries—local, state, and national.

"The coöperation of the Advisory Councils and the goodwill of all members of the Medical Association is earnestly requested."

Our state president, Mrs. M. A. Nicholson, wishes all members of the Woman's Auxiliary of the Minnesota State Medical Society a "very merry Christmas and a happy and prosperous New Year."

Hennepin County

On Nov. 14, 15 and 16 members of the Hennepin County Auxiliary sponsored the sale of handicraft of the patients at Glen Lake sanatorium, which was held at Dayton's in Minneapolis, the proceeds from this sale going to the patients who made the articles. This worthy project has been carried on for a number of years by the Hennepin Auxiliary. The chairman this year was Mrs. J. C. Davis.

Scott-Carver Counties

Word has been received from the Scott-Carver Auxiliary that six new members have been added to their group. At the fall meeting a Public Relations and a Hygeia chairman were appointed. The meeting was held Nov. 7th in Belle Plaine and the members met with the doctors for dinner and later at the home of Dr. H. M. Jourgens.

St. Louis County

Mrs. M. H. Tibbetts, member of the St. Louis County Auxiliary, is chairman of the Committee of Management of the International Institute and was the general chairman for the International Harvest Festival held Nov. 12, at the Y.W.C.A., Duluth. Mrs. A. T. Laird also served on this committee.

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Mrs. D. W. Wheeler of Duluth was a speaker at a recent meeting of the Duluth Woman's Club. Her subject was "Puppetry as a Hobby."

* * *

The Matinee Musicale of Duluth held its first meeting October 29, with Mrs. Inez Molander Hilding, a member of the St. Louis Auxiliary, as violin soloist and Mrs. Peers Buckley, also a member, appearing in a double piano number.

* * *

Mrs. W. N. Graves of Duluth has been elected first vice president of the Children's Home Society of Duluth, and Mrs. L. R. Gowan was recently elected president of the Woman's organization of the "Our Lady of the Rosary" church.

* * *

A group of auxiliary members in Duluth are interested workers in the Needlework Guild including Mrs. P. G. Boman, Mrs. W. A. Coventry, and Mrs. Robert Graham.

* * *

St. Louis County Auxiliary held their annual rummage sale recently. The general chairman was Mrs. W. A. Coventry, assisted by the following: Mrs. M. A. Nicholson, Mrs. W. E. Hatch, Mrs. R. S. Forbes, Mrs. M. G. Gillespie, Mrs. P. S. Rudie, Mrs. M. McFischer, Mrs. William Strobel and Mrs. T. O. Young.

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Nine St. Louis County schools submitted entries in the 10th annual high school essay contest on tuberculosis. Our state president, Mrs. M. A. Nicholson, was instrumental in promoting this contest in the St. Louis county Schools and the St. Louis Auxiliary carried on with the project and will present \$10 to the St. Louis county winner.

Practically all tuberculous individuals are Vitamin A deficient, whether as a cause of tuberculosis or an effect is not known. Marked Vitamin A deficiency might indicate that a thorough chest examination is in order if no other cause be found for this deficiency. Vitamin A deficiency is believed to be widespread.—R. HARRIS and J. HARTER, *Southern Med. Jour.*, Oct., 1940.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE MARCH OF MEDICINE. Number IV of the New York Academy of Medicine Lectures to the Laity. 168 pages. Cloth, \$2.00. New York (Morningside Heights): Columbia University Press, 1940.

In this handy volume are included six essays dealing with the history of various phases of medicine. "From Folkways to Modern Medicine" is presented by Walter C. Alvarez; "Health in Elizabethan England" by Sanford V. Larkey; "Not So Long Ago" by Cecil K. Drinker; "The Romance of Modern Surgery" written by Charles Garden Heyel; "The Story of Insanity" by R. G. Haskins and "The Cinderella of Medicine" by Karl A. Menninger.

The authors present their material in an easily readable style. The essays seem to be written with the purpose of exposing the reader to historical scenes so that in comparing them with the present he may have a perspective which will clearly show the advances which have been made in medical thought. Methods of medical practice with their social and economic implications are not dealt with in this book. Although this subject is highly controversial the layman is profoundly interested in it and elucidation of progress in this phase of medicine might be a valuable subject for a forthcoming essay.

WM. D. COVENTRY, M.D.

VIRUSES AND VIRUS DISEASES. Lane Medical Lecture Series. Thomas M. Rivers, M.D., Sc.D. 133 pages. Illus. Price \$2.50. Stanford University, California: Stanford University Press, 1939.

This is a most delightful, concise, and authoritative review on the present status of facts and theories concerning viruses. It consists of five lectures originally presented in the series of Lane Medical Lectures at Stanford University.

The first chapter on lymphocytic choriomeningitis cleverly reveals the multiplicity of methods used in the field of virus research while at the same time simply narrating the now accepted facts concerning this disease entity. One is convinced the laboratory methods used are not so complicated but that the better hospital laboratories may soon furnish the physician with specific means of diagnosis of this and other important virus diseases of man.

The hyperplastic and necrotizing lesions of virus diseases individually and as a group are discussed in the second chapter with a discussion of the frequently observed Bollinger and Borrel inclusion bodies.

Among many other facts, one learns that the viruses act very much like the wide variety of disease producing bacteria in relationship to their immunological and serological phenomena. One very important and possible exception is apparent in that the intracellular environment of the virus in certain cases is a protection against high titered antibodies in the blood of the in-

fected individual. This has a fundamental bearing on the use of immune sera in certain diseases which is discussed in the last chapter on therapeutics in virus diseases. One of the most discouraging observations in this chapter concerns the probability of a completed spread of the virus of poliomyelitis before clinical manifestations of the disease, thus putting the virus in the protection of the cytoplasm of the nerve cell.

This book is exactly what the busy practitioner wants to read to keep astride with developments in the field of internal medicine.

ARTHUR H. WELLS, M.D.

AS THE TWIG IS BENT. Leslie B. Holman, M.D. Associate in Psychiatry, Johns Hopkins Medical School; Assistant Visiting Psychiatrist to the Johns Hopkins Hospital. 291 Pages. Price, \$2.25. New York: The Macmillan Company, 1940.

Foreword by Adolf Meyer: "There are many books concerning the education of children and advice to parents. Very few are built on the experience of one who is not only an investigator or consultant but also a genuine practitioner intent on seeing good advice actually carried out."

This reprinted book bespeaks the author's success.

LILLIAN L. NYE, M.D.

CANCER OF THE BREAST AND CANCER OF THE UTERUS. Marion Ellsworth Anderson, A.B., M.D. 106 pages. Illus. Cloth, \$3.50; paper, \$1.00. Clinton, Iowa: The Franklin Press, 1939.

The author presents in this miniature volume the observations of his own experience and a résumé of the important literature on cancer of the breast and cancer of the uterus. The text, of about one hundred pages, discusses the theories of cancer as well as showing the various types of malignant growths in both of these organs. There are many photographs and photomicrographs of the malignant lesions found in the breast and the uterus.

A considerable space is devoted to early diagnosis such as transillumination of the breasts, Schiller's test, and biopsies, each of which is fairly well evaluated. The treatment of malignant lesions in these two organs is discussed and included in this discussion is the technique of radium application and illustration of the various procedures used.

This is a concise and brief discussion of malignancies in the breasts and uterus and should be very valuable to the general practitioner who does not have available, or does not desire, the more detailed discussion of lesions in these organs.

RUSSELL J. MOE, M.D.

CHILD CARE AND TRAINING. Fifth Edition. Marion L. Faegre, Assistant Professor of Parent Education; and John E. Anderson, Director of Institute of Child Welfare, University of Minnesota. 320 pages. Illus. Price, \$2.50, cloth. Minneapolis: University of Minnesota Press, 1940.

This is a sensible type of book every physician should be familiar with, so that he may recommend it to those parents who want detailed advice, con-

stantly available, for the many problems arising during the development of their child. Many books of this general type have been published in response to the demand arising from an increased interest in child guidance, but few of them cover the material as well and as interestingly. The questions at the end of each chapter are especially valuable as they lead to an immediate application of the material and a better grasp of the principles involved.

Teachers, nurses, and physicians, as well as parents, will gain a good deal from this book. Much of the material may be familiar to some and others may question it in part, but everyone who reads it will benefit either in the acquisition of new ideas, or in a better crystallization of ideas already held. The book is well illustrated and includes valuable suggestions for toys, reading material, and music, in fact, for everything that will contribute to the fullest development of the child.

ROBERT PEERS BUCKLEY, M.D.

SYNOPSIS OF PRINCIPLES OF SURGERY.

Jacob K. Berman, A.B., M.D., F.A.C.S., Assistant Professor of Surgery, Indiana University, School of Medicine. 615 pages. Illus. Price, \$5.00. St. Louis: C. B. Mosby Company, 1940.

This book takes its place with others of its type as an aid to teaching.

The first portion is devoted to chapters on the history of surgery, bacterial invasion, and the like. Thereafter, the discussion proceeds through the alimentary, nervous, glandular, and other "systems."

Perhaps less space might have been devoted to syphilis. The subject of fractures should be developed more fully.

A welcome feature of this book, which might well be included in more extensive texts, is the chapters on fluid balance, acid-base balance, hemorrhage, and shock.

A bibliography follows each chapter and there are many excellent charts and illustrations.

KENNETH E. FRITZELL.

PRINCIPALS OF SURGICAL CARE. Alfred Blalock, M.D., Professor of Surgery, Vanderbilt University School of Medicine, Nashville, Tennessee. Illustrated. St. Louis: C. V. Mosby Company, 1940.

Now and then some book comes out which "hits the nail on the head" so to speak, in one of the avenues of medicine. In the opinion of the reviewer this is such a book. It is only about two centimeters in thickness, but it contains much valuable information gleaned from experimental data which have contributed to make modern surgery what it is today. It should be a desk book for all surgeons. To the surgeon who received his training twenty or thirty years ago, it should be a great help in the revision of certain routine measures.

The relation of disruption of wounds to low protein content of the blood is discussed. Prothrombin deficiency, its relation to bleeding and its dependency

on certain vitamin ingestion is discussed and the conduct of surgical cases in diabetics is clearly described.

Some of the pitfalls in the surgical after care in hypertensives and nephritics are outlined.

The rationale for the proper use of fluids pre-operatively and postoperatively and the indications for fluids of the right sort are clearly discussed. Routes of error in this respect are pointed out.

Hypertension and nephritis in surgical patients are handled in a sane and matter-of-fact way and post-operative pulmonary complications which constitute probably the greatest hazard in abdominal surgery are given merited space and discussion.

This little book can be made one of the most useful aids to the surgeon of today if he will utilize the material it contains.

ARTHUR N. COLLINS, M.D.

THE FIRST FIVE YEARS OF LIFE; A GUIDE TO THE STUDY OF THE PRE-SCHOOL CHILD. Arnold Gesell, M.D., et al., The Yale Clinic of Child Development. With 21 plates. 393 pages. Price, \$3.15. New York, London: Harper & Brothers Publishers, 1940.

This is a welcome book; the embodiment of fifteen additional years of experience and investigation in the author's entirely rewritten and extended text, "The Mental Growth of the Pre-school Child," published by the Macmillan Company in 1925. It depicts the psychological and medical aspects in a technical manner, with

a very human touch. The gradation from birth to maturity is presented in a complete growth picture.

A Pictorial Survey of Pre-school Behavior is presented in the twenty-one plates. There is a list of 142 Selected References.

Every one interested in a child will await succeeding volumes of this masterful touch from The Yale Clinic of Child Development. This volume is unreservedly recommended.

LILLIAN L. NYE, M.D.

DOCTORS IN SHIRT SLEEVES. Edited by Sir Henry Bashford. 294 pages. Cloth, \$2.50. New York: Veritas Press, 1940.

This group comprises a group of essays, written by a number of English physicians, which first appeared in the British Medical Journal, *Lancet*, under the heading "Grains and Scruples." The subject content, which runs the gauntlet from musings on patients and hobbies to personal reflections, reminiscences, and philosophies, was so well received that it was felt advisable to incorporate the most interesting of them in book form.

A brief review of the titles of some of the essays, "Crabbed Age and Youth," "From the Back Streets," "The Life of a Surgeon," "On Hobbies," "An Old Diary," "Some Forgotten Medical Journals," "Medicine and Philosophy," "Retirement and a Garden," and many others will at once make apparent the vast

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The book can be well recommended for its interesting content, for its ability to capture the interest and hold the attention of its reader; and for its purpose in seeking to afford a few hours of enjoyment and enlightenment to those into whose possession it comes.

A. J. SPANG, M.D.

PROCTOSCOPIC EXAMINATION AND DIAGNOSIS AND TREATMENT OF DIARRHEAS.
M. H. Streicher. 149 pages. Illustrated. \$3.00. Springfield: C. C. Thomas, 1940.

"The object of the book is to present a brief, clear method of proctoscopic examination and to outline the diagnosis and treatment of the most common forms of diarrhea."

The above quotation from Dr. Spreicher's preface to his small volume aptly describes the scale of his work. This short textbook of about 150 pages is well illustrated and is divided into two parts.

Part I consists of three chapters and describes the main points in technic and the equipment necessary for a complete proctoscopic examination. In addition there is an excellent summary of the findings in over

2,400 proctoscopic examinations with a clinical summary of some of the illustrative cases observed.

In Part II there are four chapters concerned with the diagnosis and treatment of diarrheas which includes a practical etiological classification of the types of diarrheas. A short bibliography and index complete the volume which recommends itself to the use of all who would avail themselves of a practical dissertation on a well-established but too often neglected form of diagnostic procedure.

M. L. STRAUS, M.D.

I SAW FRANCE FALL. René de Chambrun. Price \$2.50. New York: Morrow, 1940.

To one who is interested in the causes of the fall of France, the reading of this small book by a citizen of both France and the United States is recommended. When things come to such a pass that a considerable number of the national legislators must refer to a foreign ruler before voting and when the president of a country fears to arrest leaders of a party outwardly advocating overthrow of the government by force, the foundations of the country can be expected to crumble when a storm of foreign invasion arises. There is much of value in the book as an example to our own country.



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Fiftieth Anniversary
of the
Medical School
of the
University of Minnesota

ROUND TABLE

October 12, 1939

THE fiftieth anniversary of the founding of the medical school of the University was the occasion of a scientific program held October 12, 13 and 14, 1939, at the University. The theme of the three-day meeting was: Some Trends in Medical Progress with Particular Reference to Chemistry in Medicine.

The main address delivered during the three-day session will be published in the near future by the University of Minnesota press. The Round Table discussions, held October 12 and 13, were considered of sufficient interest to warrant publication and are here presented in the form of a supplement to the January, 1940, issue of MINNESOTA MEDICINE.

With the discussions appear brief bibliographic sketches of the leaders in the various Round Table groups.

Supplement to MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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No. 1

THE CLINICAL SIGNIFICANCE OF WATER AND ELECTROLYTE BALANCES

Chairman: DR. ANCEL KEYS

Professor of Physiology
University of Minnesota

Leader: DR. JOHN P. PETERS

Professor of Medicine
Yale University

DR. A. KEYS: The subject matter of this Round Table has its general interest distributed over a wide range of subjects from physics to the application in the clinic, and I think this is reflected in the large number of people in attendance today. That makes a limitation, of course, on the freedom of discussion and the intimacy of the conversations which we associate with the idea of the Round Table.

I think all of you were interested this morning to hear Dr. Peters bringing his emphasis to bear on the question as to the freedom of movement, of electrolytes and of water, within the body and within the different organs of the body. Sixteen years ago the classic paper of Van Slyke, Wu and McLean initiated what we thought was a final solution to the problem of distribution of the electrolytes in terms of Donnan equilibrium. Many of these ideas originated from the work of Dr. Peters and his collaborators. The Donnan approach supplied the first approximation, and now that we see that the system is more complicated we need a second approximation.

The interest and research in this general question of mineral and water metabolism began with the osmotic studies of the middle of the last century. We have seen the field grow, the emphasis being placed for a time on the specific physiological properties of the different mineral electrolytes and the concept of antagonism. We saw then the minerals drawn into the field of the acid base balance, particularly in the interrelations with the buffer systems in the blood. A great many researches of a bril-

liant character were carried out along those lines. In recent years there has been a growing interest in the relation between the electrolytes and the hormones, notably the adrenal cortex and secondarily the hormones of the pancreas, the adrenal medulla and the other endocrine organs. A new field has developed which is concerned with the interrelation between the electrolytes and the metabolism of organic substances, particularly the carbohydrates. We see now that when we discuss the mineral ions we must take into account not merely the physical properties of membranes but also the questions of electrolyte-organic combinations and the influence of the endocrine glands and their secretions on these combinations.

DR. JOHN P. PETERS, John Slade Ely Professor of Medicine at Yale University, has for many years combined with the practice and teaching of the healing art at the bedside, a thorough laboratory study of chemistry as applied to the diagnosis and treatment of disease. With Dr. Donald D. Van Slyke of the Hospital of the Rockefeller Institute in New York City, he is the author of authoritative and widely read books on this aspect of science in medicine. Dr. Peters' investigations have dealt for the most part with the chemistry underlying the movement of fluids and dissolved substances within the body, a problem which medical men consider of consequence in many diseases but which have their most obvious application in diseases of the heart and kidneys. A scholarly consideration of these and related subjects has been presented by Dr. Peters in numerous publications and in a book which he has entitled simply "Body Water."

Dr. Peters is a native of Philadelphia and received his earlier training at Yale and Columbia Universities.

Dr. Peters will initiate the discussion now with some informal remarks on the general subject.

DR. JOHN PETERS: The title of this conference, "The Clinical Significance of Water and Electrolyte Balances," seems to me to embody a most invidious concept. It carries the implication that clinical medicine is not part of the physiological sciences but that it merely impinges upon it.

I should like to enlarge somewhat on the subject on which I opened this morning, the necessity of forsaking the categorical method in the consideration of physiological problems. Specialization in technical procedures is essential to expert work, but when specialization is allowed to carry over into the philosophical domain, it becomes a vicious bar to progress. Water and electrolyte balances are not independent functions. They do not exist for and of themselves; hence they are merely expressions of metabolic processes. Their measurement must, therefore, be ultimately purposeless unless this fundamental relationship is kept continuously in mind, and I believe it has not been. In the work of the last ten years certain general hypotheses have been established. The Starling hypothesis concerns the movement of fluids and diffusible solutes to and from the blood vessels; it states that such movements are governed by the interplay of the opposing forces of capillary blood pressure, and colloid osmotic pressure.

The Starling concept is a recognized part of clinical physiology that has worked a beneficent revolution in clinical practice. There are few left to deny that the kidneys perform their function by withdrawing solutes and water and adding certain solutes to a glomerular ultrafiltrate, the formation of which is governed by the Starling principle. However, in this connection physiologists and clinicians have been slow in escaping from their old habit patterns of regarding the kidneys as purely excretory organs resembling somewhat complicated sieves.

The universal equality of osmotic pressure throughout cells and fluids of the body is quite generally accepted, as is the fact that all cells are bathed in an undifferentiated fluid, which has the characteristics of an ultrafiltrate of serum. Likewise it has been reasonably well established that sodium and chloride are, with few exceptions, excluded from the cells of the body and are confined to this interstitial fluid. It follows from these two facts that, other

things being equal, the water content of the cells of the body is determined by the concentration of sodium in the interstitial fluid.

The obvious clinical inference is that conditions which lead to sodium depletion must cause the cells of the body to imbibe water, thus diluting their contents and consequently disorganizing the chemical processes within them. The growing recognition of the necessity of maintaining the concentration of sodium and chloride in the body at optimum levels has greatly improved the treatment of post-operative states, vomiting, diabetes, advanced nephritis, and a variety of other conditions in which dehydration and salt depletion develop for one reason or another. Because the distribution of water and the hydration of cells varies with the sodium concentration of the serum it has been inferred that the osmotic effect of this sodium must be balanced within the cells by an osmotically equal load of potassium. This is not, however, an inevitable corollary; interstitial fluid is a relatively simple medium in which inorganic ions are almost unrestrained.

The contents of the cells are highly complex and all that we have learned of them would lead us to suppose that the activities of even their inorganic constituents are highly conditioned. This difference is evidenced by the extraordinary tolerance of the organism to extreme changes in concentration and quantities of sodium and chloride. All the disturbance produced by such alterations can be attributed apparently to their effects on osmotic or acid-base equilibrium. In other respects, sodium and chloride appear to be physiologically almost inert. They have little or no influence upon metabolic processes from which they are excluded by the cellular membrane. Potassium and magnesium, on the other hand, play important and essential roles. Their injection is followed by toxic symptoms quite unrelated to and out of proportion to their possible effects on osmotic pressure and acid-base equilibrium. These symptoms are presumably evidences of disturbances of the metabolic processes in which these elements participate within the cells.

Exogenous potassium salts are excreted almost like foreign bodies with more economy of water than is exercised in the excretion of exogenous sodium salts. There is something logical then in the conventional association of wa-

ter with sodium and chloride. But if knowledge is to be secured concerning the utilization of other ions, especially potassium and phosphate, other points of reference more closely connected with cellular metabolic processes must be found. Moreover it must be recognized that ultimately the factors that determine the excretion of even sodium and chloride may be indirectly but nevertheless indissolubly related to these same cellular processes. In both Addison's disease and advanced renal insufficiency the concentrations of sodium and chloride in the serum fall; presumably the renal tubules no longer reabsorb salt in the usual manner. In both conditions administration of extra salt has a beneficial effect, but beyond this the analogy fails. The symptomatology of the two conditions is entirely dissimilar. In Addison's disease, moreover, symptoms and signs may be alleviated at once by the administration of adequate amounts of potent cortical extract without addition of salt. In nephritis, as far as we've been able to determine, cortical extract is without influence upon salt wastage or symptoms.

I say this rather emphatically at this moment because so many people are saying, "Cortical extract controls salt excretion by the kidneys and so we should give it in all states of salt depletion."

In some cases with advanced tuberculosis and in pneumonia, the kidneys often allow salt to escape in an inexplicable manner. From the standpoint of salt balance these patients seem to be indistinguishable from those with Addison's disease. I know no test so far provided to distinguish Addison's disease by the electrolyte pattern without some other clinical criteria.

The symptomatology of these cases is quite different. Administration of salt appears to have little influence upon their condition, or less influence than it has in other cases of salt depletion. We have been able to detect neither clinical improvement nor change of salt balances in these conditions after administration of cortical extract. We are forced to recognize therefore that there must be differences in the significance of salt wastage in these conditions. It has been discovered that during the crisis of Addison's disease, or after the removal of the adrenals from animals, the excretion of potassium diminishes as that of sodium increases.

It would be easy to infer, and it was inferred, that the kidney re-absorbs more than the usual amount of potassium, and that the crisis is merely a manifestation of potassium poisoning. However, these crises may come on before the serum potassium has risen appreciably, and bear little or no resemblance to the symptoms of potassium poisoning. The cells seem to be holding excessive amounts of potassium. It was natural to wonder whether the retention in the cells of so much potassium increased their internal osmotic pressure, thus exaggerating the swelling of the cells that resulted from depletion of the extra-cellular sodium.

When this point was examined, Harrison and Darrow found that the cells apparently didn't take up water in response to this excessive load of potassium. This potassium was obviously osmotically inactive. Does it demand a far stretch of the imagination to surmise that the potassium retention is an expression of a derangement of those metabolic processes in the tissue cells in which potassium is involved? Would it seem absurd to consider the failure of the kidney to re-absorb sodium salts as an expression of the derangement of the metabolism of some of the renal tubule cells?

In Addison's disease administration of extra potassium has the most unfortunate effect. But in familial periodic paralysis it was found that administration of potassium salts relieved symptoms. It was thought that the attacks of paralysis were precipitated by the wastage of potassium in the urine, especially when serum potassium proved to be low during attacks of the disease. When the condition was investigated in detail, however, it was discovered that the excretion of potassium during and just before an attack did not increase, rather it diminished, and that the potassium given for the therapeutic purposes was retained without any rise of serum potassium. Apparently something in the muscle cell in familial periodic paralysis creates a demand for unusual amounts of potassium to permit the orderly continuation of the metabolic process.

The study of salt and water balance doesn't need any justification in the clinic at this date but it does need integration with the study of other metabolic processes. And I should like to add again in defense of the clinic that just as the clinic has often led or pointed the way

to physiology in the elucidation of problems of salt and water equilibrium so it need not stand upon the order of its going in this new direction, because experiments are provided every day by disease.

DR. KEYS: I should like, first, to thank Dr. Peters for his discussion and, second, to remind you that Dr. Peters will attempt to answer questions or to discuss specific points which you may raise.

I suspect Dr. Owen Wangenstein may wish to make some remarks on the relation of these questions of water and mineral metabolism to the practice of surgery.

DR. OWEN H. WANGENSTEEN: There are a host of problems which arise every day in the clinic, which are centered in water and electrolyte balance. A number of these are explicable from our present knowledge; many remain a mystery. A number of years ago when I first became interested in the problem of obstruction I happened one day to give some dogs water under the skin and that unfortunately went on for a few days. I learned to my dismay that dogs given water under the skin die. We know that a person can drink water by mouth over a long period of time without taking any food and survive. I've often puzzled over that problem; I wondered how it could come about, whether there is a basal collapse, or what it is.

Problems which concern the surgeons more immediately, of course, are problems which relate to administration of fluids after operation. One thing most surgeons wish for and hope some day to see is a fluid other than sodium chloride which can be given subcutaneously or intravenously. We can use glucose dissolved in water, and it can be given under the skin, but it is a rather painful agent.

DR. KEYS: Dr. Peters, could you attempt to throw some light on those quite difficult questions?

DR. PETERS: I don't know what to say about the dogs getting water under the skin and dying. But I don't think that one can for a moment analyze such a problem in terms of quality. One would at least have to consider terms of quantity. Now the same thing is true also in this surgical procedure; I have been for a long time extremely interested in handling gastric cases.

I have found it peculiarly difficult to penetrate surgery or to do anything with gastro-intestinal cases because there were certain hindrances or conventions. The first one of them was that as soon as the patient arrives some fluid is administered, regardless of other considerations. Therefore, I never had any base line to begin with. So I started off with a condition that no surgeon would ever want to touch, mercury poison, a condition in which the whole gastro-intestinal mucosa is absolutely torn to pieces. I tried to see how much fluid was needed. I also tried to find out what the gastro-intestinal tract could do under those circumstances if you just gave it a chance to do something by itself. I found that if you didn't give such patients any fluid at all by mouth, tube or otherwise, the vomiting and the diarrhea ceased. In fact we had one man who went without vomiting, diarrhea or urination for five days. He seemed to be in pretty good shape and was sitting up reading the paper at the end of that time.

I don't see why people should object to giving sodium chloride. I think the objections to giving sodium chloride lie largely in failing to meet a quantitative equation. Of course, I don't see any reason for attempting to give sodium chloride intravenously to keep up with the surgeon who puts a stomach tube down and washes out the stomach with water. He washes out the chloride faster than I can ever put it in by the skin or veins and we have been able to recover 72 grams of sodium chloride in the washings from the gastro-intestinal tract of a patient in the course of one day while the poor interne was hard put to it to supply chloride in the other direction. Dr. Wangenstein doesn't make this kind of error but it is very commonly done.

In diabetic acidosis, where bicarbonate is low, it may be thought that bicarbonate should be used. However, it won't do the least bit of good to make a completely perfect pattern of the patient's serum if he is still so depleted of chloride and fluid that the total amounts of chloride, bicarbonate, and everything else are far below the normal level. On the other hand, if the patient is given enough sodium chloride and give his kidneys half a chance to work, he can perfectly well adjust this pattern unless he has severe renal disease. The very small

amounts of potassium and calcium required in the serum are being supplied to the patient in more quantities than he needs from all the tissue cells that are being broken down. Apart from these, sodium and chloride make up the whole of the way. Why should I want to give him anything else? Chloride makes up a great part of the anions. Bicarbonate, which is the rest of it, is always available because the patient is continually producing CO_2 in ample amount to make up his bicarbonate. The only trouble is that if you are going to give sodium chloride alone you must make sure you are giving it in proper quantities so that the kidneys will react. Hartman's old experiments prove that. Sodium chloride is the ideal solution because it comes nearer providing everything you need. And if you do not get the proper patterns in the serum of electrolytes as a result don't blame sodium chloride, but blame yourself for having given improper amounts of sodium chloride.

Glucose is given sometimes with sodium chloride and sometimes without. Glucose supplies carbohydrate to prevent the breakdown of carbohydrate metabolism and the acidosis that might result. It is a nutritive material. Water is administered with it also and if the solutions are properly balanced there is available the little extra water needed to provide for his insensible perspiration.

The main thing I should like to bring out is that the patient's urine volume must be followed. It is not necessary to supply enough sodium chloride to make 4 liters of urine a day; you don't have to try to produce edema in a patient who is usually malnourished from lack of proteins. You must see that his kidneys are getting rid of a liter or a liter and a half of urine a day in order that they may adjust the patterns which you can't quite adjust by Hartman's solution or any other expedient. If you want to add a saline plus glucose there is no harm and it provides something to burn. I don't see any reason to give lactate to be burned when CO_2 will form the bicarbonate that you need.

DR. KEYS: The question of water and salt binding by the proteins must remain a key point to be settled before it is possible to discuss water and salt exchanges in the body in a truly quantitative manner. If any appreciable fraction of the water is restrained from its or-

dinary solvent action by the proteins, then osmotic activity calculations based on total amounts of water and salt must be erroneous. Dr. R. A. Gortner has for some years insisted that some of these matters of the inter-relations of electrolytes and proteins are not as simple as they seemed at one time.

DR. R. A. GORTNER: I was very much interested this morning in Dr. Peters' statement that the Donnan equilibrium did not tell the whole story, and that some of the anions and cations were immobilized. I notice that Dr. Peters didn't use any terms which are common in the colloid literature, but, after all, I think possibly the phenomenon of adsorption may explain certain of these ion inactivations. At least I'm rather convinced that way myself. And as long as we are dealing with surfaces, it's perfectly evident that the state of the colloidal material within the cell, if it is varied at all, will vary the surface exposure and will shift—in my terminology or in the colloid chemist's terminology—the adsorption equilibria which are so characteristic in many cases of potassium as contrasted to sodium. Perhaps the colloid chemist's terminology doesn't tell the whole story but it gives us a certain picture and the change from health to disease can be looked upon to some extent at least, it seems to me, as a change in the physical state of those colloidal constituents which go to make up the protoplasm.

I will admit that our technics of measurement are not adequate for solving many of those problems. But I think that with that viewpoint kept in mind and with the intensive studies of acid-base changes, electrolyte changes and water-equilibrium changes which are being made in so many physiological laboratories, some day we shall get to a point of synthesis where the physiologist and the colloid chemist and the physical chemist all will talk in essentially the same terms about the same phenomena. I am sure that the colloid chemist and the physical chemist and the physiologist are not so much interested in defining the terms in which a physiological process is operating as they are in actually getting down to the facts of the case, and in finding out what is actually going on under one metabolic condition or under a pathologic condition which is imposed upon the normal physiology of the cell.

DR. KEYS: I think that Dr. Peters is star game, and as many times as we can get him on his feet is all to our benefit, in spite of the fact that I am sure that he must look forward with dread to this rather concentrated program that we have for these two days.

DR. PETERS: I want to correct what possibly may have been an error in understanding what I said this morning. If I said that the Donnan equilibrium couldn't explain some of these phenomena and things have been squeezed into it, it was no aspersion on the Donnan equilibrium. I believe that has been established on thermodynamic principles by Gibbs and by Donnan which none of us would dare to question. The only point is that it is only applicable to certain provinces and we've tried to squeeze all kinds of things into it. I think perhaps the best illustration I can have of that is the time when Dr. Van Slyke—and remember I should never cast any aspersions on Dr. Van Slyke—explained the distribution of ions between the red cells and the serum on the basis of Donnan equilibrium. Prof. Donnan was there as the first discussor. He got up and said, "I should never have had the temerity to try to apply my equilibrium to such a complicated system. I am lost with amazement that it can have been so applied—and I am still doubtful."

DR. GERALD EVANS: I am interested in these questions with regard to problems of muscle physiology and of the adrenal cortex. I think it is exceedingly significant that Kendall has separated out several distinct compounds from the adrenal cortex, any one of which when injected into the patient with Addison's disease almost miraculously corrects the disturbance of salt and water metabolism.

Moreover, one of those same compounds has been shown recently by Long and his associates at Yale to be apparently equally potent in another direction, namely, effecting the conversion of protein into carbohydrates. I found that in the absence of the adrenal cortex, protein is not converted into carbohydrate very readily. I took a lot of trouble to find out whether or not the defect preceded the defect of salt metabolism. I found that the protein-carbohydrate conversion was damaged before any of the recognized signs of adrenal failure had appeared, namely, the depletion of sodium eleva-

tion, and the potassium and urea increase in the blood.

We might like to think that the protein carbohydrate metabolism determines the electrolyte metabolism. But I can't be sure that that is so. I'm a little bit afraid that the story might equally be the other way around. Of course, that's exactly the point, we are lacking a lot of facts in general physiology.

There is one other point. Although one recognizes that potassium is held within cells and sodium outside of it, we look upon it as a great mystery. We recognize too that phosphates, soluble or inorganic or esters of low molecular weight, are in the fluid. I'd be very interested to have Dr. Gortner's comment on whether phosphate can be in any sense osmotically active and still be held by adsorption to enzyme systems.

DR. GORTNER: Well, yes, a phosphate could still have osmotic activity though held by enzyme systems since in the phosphoric acid the oxygen molecules will attract to themselves water shells, and thus the osmotic activity would be what is heresy to a good many people, that is, a binding or release of colloiddally held water. If that in fact can be done, it will also depend, altogether, on what the phosphate is associated with as to whether you have this variable water relation. There may be osmotically active water and osmotically inactive water if you want to put it in those terms. Some water may be more or less fixed to polar groups of the proteins of phospholipins and of all sorts of systems.

Depending on whether those polar groups are exposed toward a free water surface, or whether those polar groups are buried in a colloidal matrix where the free water surface is not so generally available, there will be a shift, it seems to me, in the osmotic properties of the system, even if you have the same number of osmotically available ions. I realize that this hypothesis doesn't have general acceptance by everyone. But I think the evidence is piling up more and more that we must recognize that a considerable fraction of the water molecules are not freely mobile in the presence of the hydrophilic colloids. They maintain a more or less fixed position. More and more types of evidence have been introduced in recent years pointing in that direction and I don't see any

particular qualitative difference between the immobilization of a water molecule on a colloid surface and the immobilization of five molecules of water in the case of copper sulphate. We know perfectly well from a good many physical chemical measurements that ions are hydrated in solution. The massive protein molecules containing the peptide groupings, amino groupings, carboxyl groupings, and so on and so forth, all tend to attract water molecules which lose a certain amount of kinetic energy when they come within their sphere of action. The more recent studies indicate that after all water is a pretty complex system to begin with; that we have actually, at room temperature, fragments of what you might call ice, floating around in ordinary water. If one shifted the equilibrium between polyhydro and monohydro water molecules theoretically there should be a shift to some extent of the osmotic behavior of ions suspended in that particular system.

DR. KEYS: Many of us will remember the ease with which A. V. Hill some years ago disposed of the phosphates in setting up a balance between the red cells and the plasma to account for the osmotic equilibrium as it seemed to be at that time. I think that we are now well aware, of course, of the extraordinary complexity of the system which Hill lumped together as phosphorus expressed as H_3PO_4 with 70% osmotic activity. Today few would venture to make a final balance sheet for the osmotic relation between red cells and plasma. The uncertainty as to the osmotic activity of the phosphates inside the cells is one major obstacle. This is even more true of the muscle cells where the hexose phosphates confuse the picture still further.

In addition to the complexities already mentioned, we must not forget that we seldom have, in the body, the conditions of a true equilibrium. Membranes which are ultimately permeable to a given ion or molecule may offer considerable restraint and thereby slow down the passage of that ion through them. What is the effective osmotic activity of the solution containing that ion or molecule during that time? When large movements of fluid across a membrane are taking place rapidly, even chloride may have osmotic effects where, given time, it would have zero activity. There seems to be good reason to believe that an osmotic buffering action may

arise in all systems where membranes are differentially permeable to solutes so that they pass through at different rates.

DR. ARILD HANSEN: I should like to ask what criteria are used for determining the amount of sodium chloride to administer, whether it is a measure of the vascular bed, whether it is excretion, whether it is amount of the gastric fluid which has been removed, or whether it is the clinical picture. We are interested in our department, particularly Drs. John Anderson, Thompson and McQuarrie, in the question of the relationship of sodium chloride to the carbohydrate metabolism as it affects the diabetic. A diabetic child in coma given large quantities of sodium chloride by mouth had a very rapid recovery, but with this rapid recovery was a great increase in blood pressure which went to pathological bounds. Diabetics were placed on a regular type of diabetic diet with vegetables, etc., and were given quantities of sodium chloride varying from probably 5 to 30 grams in a twelve hour period. These individuals exhibited a great decrease in the output of sugar as well as a decrease in the insulin requirement. However, when blood pressure was measured these young subjects were found to have become hypertensive with systolic pressures of 160, 170 and 180. When the potassium salt was used in the same type of study the opposite response occurred.

DR. PETERS: I can't help wondering whether Dr. Hansen is speaking of diabetes in general or certain diabetics. In certain attempts to test the effects of sodium on our diabetics we have not been successful in duplicating these effects.

I can't help for a moment just stopping at one point, and asking Dr. Hansen what he means by potassium to sodium ratio. I don't see any reason for the use of the term ratio or applying it to an entirely independent variable. The term "albumin-globulin ratio" is another case in point. Why not take account of the amount of albumin that is in serum and the amount of globulin? As far as we know in origin, and function and every other respect these proteins are entirely different and their effects on osmotic pressure are different. It makes all the difference in the world whether you've got a high globulin or a low globulin and a high albumin and a low albumin but I

don't see that it makes any difference in the world whether you've got a high albumin-globulin ratio or a low albumin-globulin ratio. We have heard of sodium and potassium ratios, calcium and potassium ratios, magnesium and sodium ratios, and everything else; but as far as we know, the further we go the more we appreciate that these ions all have their individual functions and their particular abilities to perform certain reactions or to participate in them.

Now, to go back to the other subject. Potassium is a dehydrating salt. It is excreted with a great economy of water. We never have been able to get any other salts that have such relatively low concentration in the plasma and such enormously high concentrations in the urine. It is excreted as a foreign body and takes with it a certain amount of water, enough to be dehydrating within limits.

Dr. Hansen asked how we found out that people were hydrated or dehydrated. Well, we can't at the present time. We are peculiarly unable to. I don't believe that we have a method that really accurately measures blood volume in the first place. I think that all plasma volume or blood volume methods measure something in addition. There is very good evidence of that in Smith's old experiments which are so much neglected at the present time when we use spectrosopes, spectrophotometers and all kinds of elaborate instruments. We are becoming more accurate in analysis without considering the fundamental defects in the blood volume system which affect the distribution of the dyes in the blood stream.

Now we have tried at Yale to measure the interstitial fluid, and we are at present trying another method. We are also trying to measure the *total* fluid of the body. I believe all such methods will probably be a little complicated to introduce into the home or a general

service. But by the use of such methods we hope to be able to check on the clinical criteria that we now have to use to determine the hydration of the patient. At present you must rely on elasticity of the skin, the general state of the circulation, whether their blood pressure has fallen too far, the serum proteins, etc., but most of all you must look at the patient. No amount of chemistry will eliminate accurate clinical observations. But I say accurate clinical observations with my fingers crossed because I'm not sure how far any of these criteria are really a good indication at the present time. By measurement of the total amount of fluid in the body and the interstitial fluid and observation of the shifts between them, we may be able to check on these things and in a few years be able more accurately to say how much fluid a patient needs.

When you come to giving patients fluid, you give them enough first of all to take care of the depletion they've already undergone, and enough more to enable them to carry on in all functions of the body. Here is the point of looking at the volume of the urine and also at the renal functions behind it. It seems to me a little homely thing that's too often neglected when physicians are apt to ask for a sodium determination that can't possibly be done short of twenty-four hours.

DR. HANSEN: The studies on diabetic children are not my major work but that of Dr. John Anderson here. I saw the observations on eight or ten subjects and saw the general form of the responses I mentioned.

DR. JOHN ANDERSON: I think Dr. Peters may be right that one of the chief defects in our studies was the lack of full balance studies with the several types of salt solutions used.

BLOOD REGENERATION IN THE ANEMIAS

Chairman: DR. HAL DOWNEY
Professor of Anatomy
University of Minnesota

Leader: DR. GEORGE H. WHIPPLE
Professor of Pathology and
Dean of the Medical School
University of Rochester

In a few introductory remarks the chairman called attention to the complexity of the subject, and cited as one of the major problems for future study the reason for the continued normoblastic regeneration in the bone marrow of pernicious anemia on liver treatment, while other normoblastic anemias show little or no response to this treatment. It might be argued that the megaloblasts which are so numerous in the marrow of pernicious anemia during relapse are primarily responsible for the marked reaction of this marrow to liver. While this may be true during the first few days of treatment it does not account for the continuous erythropoietic response after the marrow has become normoblastic, nor for the complete change of the histological structure of the marrow, and the normalized maturation of the neutrophil leukocytes which are so characteristic of pernicious anemia blood and marrow.

Dr. Whipple was introduced at this point and attention called to the great importance of his researches on the regeneration of blood in anemic dogs, this work having led directly to the first trials on the effect of liver in the diet of pernicious anemia patients.

DR. WHIPPLE: Artificially produced radioactive iron is an extremely sensitive agent for use in following iron in the course of its changes in body metabolism, lending itself to studies of absorption, transport, exchange, mobilization, and excretion.

The need of the body for iron in some manner determines the absorption of this element. In the normal dog when there is no need for the element, it is absorbed in negligible amounts. In the anemic animal iron is quite promptly assimilated.

One may choose to believe that the iron absorption is largely a concern of the small intestine and furthermore that the mucosa is the tissue responsible for its acceptance or rejection. It may be possible to show that the epithelium of the mucosa is conditioned by the an-

DR. GEORGE HOYT WHIPPLE of Rochester, New York, has been Professor of Pathology and Dean of the School of Medicine and Dentistry of the University of Rochester since its founding in 1921. Doctor Whipple and Doctors Minot and Murphy of Boston were made joint recipients of the Nobel Prize in Medicine in 1934 for their discovery of the cause and also a successful method of treating the previously fatal disease, pernicious anemia. Other outstanding honors received by Doctor Whipple have been the *Popular Science Monthly* Award and Medal in 1930 and the Kober Prize in 1939.

Doctor Whipple was Director of the Hooper Foundation for Medical Research and Dean of the Medical School of the University of California between 1914 and 1921. Prior to the latter period he had been Pathologist at the Ancon Hospital in Panama and Associate Professor of Pathology at the Johns Hopkins Medical School in Baltimore. He is a graduate of Yale College and received his medical training at the Johns Hopkins Medical School. Since 1927 he has served as a trustee of the Rockefeller Foundation and for several years has been a member of the Board of the Rockefeller Institute of New York. He is a member of the National Academy of Science, the American Physiological Society, the Association of American Physicians, the Society for Experimental Pathology, and other scientific organizations. While his fundamental medical research work has covered a wide range of subjects, his most outstanding contributions have been those pertaining to liver function, pigment metabolism, various forms of anemia, formation and regeneration of the blood proteins, and the diseases of metabolism.

mic state of the circulating blood so that absorption of iron takes place. At any rate the curve of iron absorption by the anemic dog indicates that the peak absorption (four to eight hours after feeding) takes place when the food materials are largely in the small intestine. At the end of eighteen to twenty-four hours the radioactive iron is practically all in the colon and no significant absorption of iron is demonstrable. It would seem that the colon is not concerned with iron absorption.

The plasma is clearly the means of transport of iron from the gastro-intestinal tract to its point of mobilization for fabrication into hemoglobin.

The speed of absorption and transfer of iron to the red cell is spectacular. The importance of the liver and bone marrow in iron metabolism is confirmed.

Radioactive iron as ferrous gluconate given by vein enables us to study *iron excretion* in urine, bile and feces.

There is an initial extra output in urine and feces during a few days (three to fifteen days) following the iron injection and this may total 2 to 8 per cent of the injected iron. Following this initial reaction the urinary excretion of radio-iron drops to traces or even to zero.

The feces always contain measurable amounts of radio-iron. In five dogs receiving 100 to 250 mg. of radio-iron the fecal excretion per day settled down to 0.05 to 0.4 mg. per day.

Blood destruction by acetyl-phenylhydrazine causes a definite increase in radio-iron eliminated in the feces (0.1 to 1.0 mg. per day). Probably most of this excess iron comes through the biliary tract (bile fistula). The bile under usual conditions contributes very little iron to the intestine (0.01 mg. radio-iron per day or less).

The body controls its iron stores by absorption or lack of it rather than by its capacity to eliminate it. The evidence is overwhelming that the dog excretes iron with difficulty and in small amounts, even in the plethoric state, by means of the biliary and gastro-intestinal tracts.

Perhaps we may hazard a guess as to the capacity of the dog, whether he be anemic or plethoric, to eliminate surplus iron in comparison with the amount of iron in circulation. Dog 37-180, weight 9 kg., had a blood volume of 700 ml. and a total amount of hemoglobin in circulation amounting to 140 gm. (equivalent to 480 mg. of iron). This dog received injections of iron (or red cell equivalent of iron) amounting to 400 mg. of which 130 mg. was labeled radio-iron. The base line of radio-iron excretion was approximately 0.18 mg. per day. If the excretion of labeled iron is typical of the behavior of all surplus iron in this dog this would represent an iron excretion of about 0.6 mg. per day. If this excretion of assumed surplus iron represents the normal ability of the dog to excrete excess iron it would require about two and a half years for the animal to eliminate excess iron, equivalent to the amount in circulation as hemoglobin—evidence of the difficulty of this task for the dog.

DR. C. J. WATSON: Coproporphyrin isomer type I is regularly excreted in increased amount in hemolytic jaundice, and in pernicious anemia during relapse. Splenectomy, or administration of liver extract, respectively, brings about a significant decrease in the amount of coproporphyrin

rin I excreted. This isomer type does not correspond in configuration to the porphyrin contained in hemoglobin, so that there is no reason to believe that the increased amounts are related to the destruction of hemoglobin. On the other hand, there is much reason to consider that coproporphyrin I formation and excretion is correlated, perhaps quantitatively, with erythropoietic activity in the bone marrow. Thus, megaloblasts and erythroblasts, especially in embryonic, and in pernicious anemia bone marrow, have been shown to contain coproporphyrin. Although the significance of this is by no means clear, it appears certain that increased amounts of coproporphyrin I are formed when there is increased erythropoiesis, and this is particularly true in the group of anemias in which hemoglobin formation is not disturbed (the normochromic group, or those with high color index).

The isomeric coproporphyrin III, which does correspond in configuration to the porphyrin of the hemoglobin molecule, is increased in various toxic states, such as poisoning due to lead, arsenic, mercury, sulfanilamide and others. There is much reason to believe that coproporphyrin III is not due to an abnormal destruction of hemoglobin. For example, it has been noted in cases of lead poisoning that an increased excretion of copro-III persists long after the initial blood destructive phase of the disease has passed. It is much more likely that coproporphyrin III formation in lead poisoning is due to a disturbed formation of hemoglobin, perhaps to a blocking of the entrance of iron, into a fraction of the porphyrin intended for the hemoglobin molecule. This view coincides well with the fact that the anemia of lead poisoning is distinctly hypochromic in type, pointing to an associated disturbance in hemoglobin formation. Studies of hemoglobin metabolism in patients treated with sulfanilamide, carried on in association with Spink, have shown that the effect is similar to that of lead in that the anemia is both hemolytic and yet hypochromic. Rimington has found coproporphyrin III in the urines of rats receiving sulfanilamide. This tends to liken further the effects of lead and sulfanilamide upon hemoglobin metabolism, although it should be noted that preliminary studies which we have carried out have not shown such a regular nor marked increase in excretion of coproporphyrin as observed experimentally by Rimington. The

difference may be in the fact that Rimington's rats were given very much larger per kilogram doses than what we employed therapeutically. Further studies of this problem are in progress.

The reticulocytes contain protoporphyrin and this has been identified by Grotepass as belonging to isomer type III, in other words, corresponding to hemoglobin. The function of the reticulocyte protoporphyrin is as yet unknown. Two possibilities must be considered: (1) that it simply constitutes a slight excess of porphyrin intended but not used in the construction of hemoglobin while the cells were yet in the bone marrow, or perhaps to be used for this purpose even after the reticulocytes have gained access to the circulation; (2) that the protoporphyrin serves the rôle of a respiratory enzyme, since it has been amply demonstrated that the reticulocytes have a measurable oxygen consumption, while the mature erythrocytes do not. As yet no evidence is available in favor of one or the other of these possibilities.

The reticulocyte protoporphyrin can not be regarded as the parent substance of coproporphyrin I, because of lack of correspondence in configuration of their molecules. On the other hand, it might very well be parent to coproporphyrin III, and is another possible source of origin for the excess of this porphyrin encountered in lead poisoning and other toxic states, as already mentioned.

DR. CHARLES H. WATKINS: Dr. Downey has asked me to discuss the morphologic changes in the blood associated with blood loss. In any condition in which there is chronic blood loss, whether relative or absolute, the erythrocytes are hypochromic but the total number per cubic millimeter of blood is normal or only slightly reduced. The individual erythrocytes are paler than normal owing to a decrease in hemoglobin concentration in the cells; anisocytosis of moderate degree is usually present although extremes of variations of size of cells are not uncommon; polychromatophilia is usually increased slightly above normal and consequently the percentage of reticulated erythrocytes is usually slightly increased. Ordinarily the leukocytes are unchanged in number and appearance. In cases of long standing iron deficiency the hemoglobin may be much reduced and under such circumstances the erythrocytes may contain only a very

faintly staining ring of hemoglobin around the periphery of the cell, a condition known as anochromasia. When the hemoglobin is reduced to this extent the erythrocytes per cubic millimeter of blood are usually decreased but not in proportion to the decrease in hemoglobin. There is evidence of slight increase in erythropoietic activity; the myeloid leukocytes are relatively unchanged.

In acute blood loss the picture ordinarily is quite characteristic. There is a rapid reduction in the hemoglobin as well as in the number of erythrocytes per cubic millimeter of blood. Morphologically there is evidence of increased regenerative activity and increase in polychromatophilia; the percentage of reticulated erythrocytes is higher than normal; anisocytosis is more marked with regenerative macrocytes much in evidence. Normoblasts may also appear in the peripheral circulation. Usually there is moderate leukocytosis with the increase largely in polymorphonuclear neutrophils. If the hemorrhage is very severe, immature myeloid leukocytes may appear in the peripheral circulation, resulting in a leukemoid reaction. The blood platelets are usually increased in number in severe hemorrhage. During the recovery phase, hemoglobin regeneration ordinarily falls behind the production of erythrocytes so that hypochromic anemia occurs.

A thorough morphologic study of blood smears is of value in all cases of anemia in order to eliminate, if possible, a primary blood dyscrasia. This examination also proves of value in determining the degree of hemopoietic activity at a given stage.

It is fortunate that in most cases of secondary anemia the cause is obvious but in obscure types identification of the etiologic factor may be difficult. Frequently obscure forms of secondary anemia are due to chronic loss of blood from the gastro-intestinal tract, which may be persistent or recurrent. The bleeding may be due to malignant lesions, benign polypoid tumors, or benign ulcers of the gastro-intestinal tract. In some instances relatively slight bleeding from hemorrhoids may produce secondary anemia of marked degree. It is certain that treatment of secondary anemia should not be instituted without a complete study of the patient and not until a satisfactory etiologic factor is found. Investigation of secondary anemia frequently entails de-

CLINICAL PROBLEMS OF THROMBOSIS

tailed examination and if this is slighted a serious disease may pass unrecognized, particularly if the blood responds to the treatment given. In addition to complete roentgenologic examination of the intestinal tract, examination of stools for occult blood should be made, for often bleeding lesions of the small intestine can be recognized

only by this means. Examination of stools for occult blood should be done over a period of days, for frequently bleeding is of a recurrent type and of relatively short duration. If blood is found persistently, abdominal exploration may be advisable provided there are no features of a primary hemorrhagic blood dyscrasia.

CLINICAL PROBLEMS OF THROMBOSIS

Chairman: DR. E. T. BELL
Professor of Pathology
University of Minnesota

Leader: DR. CHARLES H. BEST
Professor of Physiology
University of Toronto

DR. BEST: Dr. Gordon Murray has established that heparin is useful in certain types of vascular surgery—in embolectomy and anastomosis of blood vessels. He has had a number of cases of embolectomy and thinks that success has been greater in those in which heparin has been used. Dr. Radwin reported a case of a young doctor who had a coronary attack and then had a mural thrombus which lodged as an embolus in the aorta. This was removed and the blood vessels sewed up in the usual way. Heparin was used and the doctor is now back at work.

It is not proved that heparin is absolutely necessary, but the use of it apparently helps. Dr. Murray has also reported a case in which he resected 4 inches of the popliteal artery and inserted the same length of the patient's jugular vein; heparin prevented thrombosis at the site of sutures. There has thus been definite success in the use of heparin in vascular surgery. It is proved that heparin can be given to the patient without danger. There is interest in the use of heparin in subacute bacterial endocarditis. Several clinics are following Dr. Kelson in his lead of using sulfapyridine and heparin together.

It is easy to show, as Dr. D. Y. Solandt and I have done, that coronary thrombosis can be prevented in animals.

DR. BELL: If you are trying to prevent post-operative thrombosis, how often would you administer heparin?

DR. BEST: Only one way—continuously. Over 400 cases in Toronto have been heparinized

PROFESSOR CHARLES H. BEST is today one of Canada's outstanding medical men and one of America's best known men of science. In 1922, when he was only twenty-two and while still a medical student at the University of Toronto, he collaborated with Dr. F. G. Banting in a Nobel Prize winning research, the discovery of insulin.

With world wide renown at such a youthful period, some thought Charles Best would rapidly disappear from the scientific horizon. They were wrong. The high place in the world of science which Dr. Best has today is certain evidence that the scientific curiosity and ability which drove him to collaborate in the discovery of insulin were not a fly-by-night "lucky break" but the mark of inborn competence. After graduating in Medicine from the University of Toronto in 1925, Dr. Best went to England where he worked in the Physiological Laboratories of Professor C. Lovatt Evans and Sir Henry H. Dale. Later, when the chair of Physiology became vacant at Toronto, the University authorities wrote to England, in search of a bright young Englishman. The reply was sharp and to the point. They were told the most outstanding young physiologist of the day was on their own doorstep. Thus it was, that in 1929 Dr. C. H. Best became Professor and head of the Department of Physiology, University of Toronto.

Extending his scientific interests beyond the sphere of sugar metabolism, Dr. Best has made significant studies on histamine, choline and other biologically potent substances. He, with collaborators, isolated histamine from the liver and later demonstrated an enzyme, a ferment found in the body capable of destroying this highly toxic substance.

Recently Dr. Best's interests have turned toward the processes involved in the clotting of blood and the methods used in preventing clot formation. His studies have found their application in efforts to prevent thrombosis of various sorts.

over the so-called "danger" periods. Heparin was used continuously for over four weeks in one case.

DR. MOSES BARRON: Over how long a period were the 400 patients heparinized?

DR. BEST: One to four weeks. The period varies. Usually it is about seven to ten days.

DR. BELL: Dr. J. S. McCartney will speak on the danger period in postoperative thrombosis.

DR. MCCARTNEY: The period of danger varies tremendously. If you are thinking of the time in which embolic lesions are liable to occur, most of them occur within the first two weeks. There are occasional instances where the fatal embolism has occurred within twenty-four hours after operation, and a few in which the embolus has taken place two to three weeks subsequent to the operation. There is the question of how long it takes a large thrombus to form.

DR. BEST: Fifteen minutes. We have seen a thrombus big enough to close the aorta form in fifteen minutes. The platelet thrombus forms first, and once the blood stream is slowed or completely stopped, then clotting and thrombus formation occur with great rapidity. Once the thrombus has formed, heparin has no effect.

DR. BELL: How far in front of the embolism does the thrombus form?

DR. MCCARTNEY: There is good reason to believe that it will go beyond the next branch.

DR. BEST: In a series of experiments on dogs, Dr. Solandt and I opened the pericardium, tied off the descending branch of the left coronary artery, infiltrated sodium ricinoleate so that it would lie against the endocardium, sewed up the chest and started heparin immediately. The thrombus formed before we could get out of the chest.

In the dog you can tie off the coronary arteries and not get any mural thrombus. In the dog, tying off a single coronary artery does not lead to thrombus formation if the endocardium is not injured.

DR. BELL: It seems obvious that if we knew how far the thrombus formation precedes the detachment of the thrombus, we would be in a much better position to advise therapy.

DR. MCCARTNEY: Most patients who have thrombophlebitis do not get embolic lesions. There are a few patients who have it and then have the embolism let loose and cause either infarcts of the lungs or fatal embolism.

DR. BELL: Some lasting two to three months do that. You think that the reason why there is only a small percentage of clinical thrombosis which results in embolism is that the thrombi are adherent?

DR. MCCARTNEY: The clinical thrombophlebitis requires complete closure of the vessel. Those with embolism do not have complete occlusion.

DR. F. J. HIRSCHBOECK: Are there any criteria as regards age, obesity, etc., for cases in which you wish to use heparin? When do you begin using it?

DR. BEST: Some surgeons operate under a moderate heparinization. Dr. Murray says to use it from two hours to five or more hours after operation; this depends on the operation. They have started after splenectomies in an hour or so. When clotting is complete there is no reason to suppose that bleeding will recur. If there is a bleeding point, bleeding will be increased by heparin. Heparin is used in prostatectomies, splenectomies, etc.

DR. HIRSCHBOECK: Dr. McCartney, most of the thrombi form during the healing period, but now the belief is that the emboli that cause trouble break off rather early.

DR. MCCARTNEY: Statistics show that many patients who die of a massive embolism have had emboli earlier with or without symptoms.

DR. HIRSCHBOECK: Is the danger chiefly during the first two or three days or the second, third or fourth weeks?

DR. MCCARTNEY: I think it is in the early period.

DR. REA: Dr. Best, how do you give heparin to the patients? Have you noticed any hemorrhagic tendency?

DR. BEST: In dogs we give an initial injection of about 30 to 40 units per kilogram, then a steady injection to keep the clotting time at twenty minutes or higher. There is no way of telling what the clotting time of the patient or dog will be, *i.e.*, there is great variation in the reaction to heparin.

DR. BELL: Can you neutralize the effect of heparin?

DR. BEST: You can precipitate all of the heparin out of the body with protamine. This was first shown by Chargaff and Olson. Protamine should not be used clinically at present.

DR. PAYNE: When will the price of heparin get down so it can be used for clinics and hospitals inexpensively? I understand that recently the local use of heparin has been recommended. Two or three years ago, Dr. Olson in New York was working on a synthetic compound similar to heparin; what is your reaction to such substitutes?

DR. BEST: Heparin is being made in Toronto at the Connaught Laboratories; the process was worked out by Scott and Charles. The details of the process have been published. It takes large amounts of lung to get a gram of heparin. The initial cost was \$12.50 per 100 mgm. It is \$2.70 now. Two vials a day is the average amount.

With regard to regional heparinization and general heparinization, it is thought to be much better to heparinize generally than locally. It is far less expensive to do local heparinization, but it seems a little unreasonable. Synthetic anticoagulants have been made. They are cheaper but are much less effective and are much more toxic.

DR. BELL: The next topic is the influence of age on the formation of thrombi.

DR. MCCARTNEY: This is based upon the findings in our postmortems and what has been gathered from the literature. In a number of papers there is a marked discrepancy in the incidence of pulmonary embolism as reported both from series of operations and also from series of postmortems. They vary anywhere in the postmortems from 0.5 per cent to 12 per cent. This does not appear to be reasonable. It means either that the postmortems were not carefully done or that there was some difference in the material in various series. In order to get some of the background of the incidence of thrombosis and embolism, I went back to early literature and found that Virchow in the 40's made a study of seventy-six consecutive

postmortems and found eighteen thromboses and eleven embolisms of the lungs. With regard to the question of age—if we stop to think of it a moment, there are practically no thromboses in children except when related to definite infectious processes, such as otitis media. When you get to older people there are plenty of instances of thrombophlebitis where there is no suggestion of any infectious process at all. In our postmortems not only the incidence of venous thrombosis increases with age until you get up into the eighth decade, but the incidence of pulmonary embolism also goes up in the same way. Each instance of pulmonary embolism presupposes that there is a thrombus somewhere. The actual incidence of thrombosis is several times that of the incidence of pulmonary embolism whether you consider the fatal cases or the non-fatal, where it is an accident and an entirely unsuspected condition. I gathered a large number of reports of operations at various sites because we have always felt that there were certain operations which were likely to be followed by thrombosis and embolism. The pelvis and lower abdomen have been particularly mentioned. Appendectomy was mentioned frequently as an operation which was rarely followed by embolism. Most appendectomies are done before thirty years of age (76-80 per cent). Practically no emboli occur in these early decades. In later decades primary appendectomy is not infrequently followed by emboli. Practically no prostatectomies are done until after fifty years of age and then the incidence of thrombosis and embolism is very high. Hernias run practically a straight line through all decades and in the later decades most of the embolic lesions take place. Gynecologic operations reach their peak along about the fifth decade; not many are done before the age of thirty. In our material the incidence of embolism seems to be about as high after transurethral resection as after a suprapubic or perineal prostatectomy. One of the prime factors in the development of thrombus and embolus is the mere opening of the abdomen and the resulting splinting of the abdomen and the change in respirations. The question of age at which the operation is done more than the actual point of operative procedure should be considered.

DR. BELL: It is, then, not the operative site

but the age of the patient that gives thrombosis and embolism. Formerly it was thought that it was the operative site.

Shall we say something about the rôle of infection in thrombosis? Some years ago it was taught that there cannot be a thrombus without an infection. We have gotten away from that idea entirely. There still remain, however, a good many thrombi which have an infectious origin.

DR. MCCARTNEY: In the postoperative thrombosis and embolism, if it is the idea that the infection is at the site of operation, this simply won't stand scrutiny because most of the post-operative thromboses and emboli have no relation to the site of operation whatsoever. There are some cases, naturally, where they are related, but in many of them it is difficult to see

how infection can spread from the site of operation to the veins of the pelvis or lower extremities, where the primary thrombosis is found.

DR. T. A. PEPPARD: We have considered thrombosis and embolism as a postoperative, post-traumatic and obstetrical complication. This should be mentioned as a medical complication and mention made of certain influences, such as pneumonia, and its occurrence in cardiac failure.

DR. MCCARTNEY: With the material here, the incidence in the medical group is a little lower than the post-traumatic, but this is due to the lopsidedness of the material. When you get to the higher decades, it becomes much more frequent in the people with heart disease and is several times as frequent in the medical cases as in the traumatic and postoperative cases.

CURRENT TRENDS IN PUBLIC HEALTH*

Chairman: DR. GAYLORD W. ANDERSON
Professor of Preventive Medicine
and Public Health
University of Minnesota

Leader: DR. THOMAS PARRAN
Surgeon General
U. S. Public Health Service

DR. PARRAN: In observing the current trends in public health many questions immediately arise as to the paths along which these trends are taking us. It is important to stress at the outset that no one knows the answers to these many questions that confront both the public and the many agencies created by the people for the protection of their health. It is only by full and frank discussion of these questions and problems that rational means of solution may be evolved and subjected to trial.

It is obvious that the problems of public health today are very different from what they were several years ago. That was the time when the health officer was the man who was supposed to tack up a sign when a case of scarlet fever occurred, and after four weeks to return and take it down. His duties in the interim were few and equally simple. That was also the era in which the problems of the practitioner of medicine were likewise simple. He could carry in his little black bag most of the materials he

DR. THOMAS PARRAN, JR., is a native of Maryland. He was graduated from the Georgetown Medical School, receiving his degree at the age of twenty-two in 1915. He entered the United States Public Health Service in 1916 immediately beginning on a rather meteoric career. By 1918 he had been made Chief Medical Officer at Muscle Shoals. In 1919 he was transferred to Washington as Executive Officer in the Medical Division of the War Risk Insurance Bureau. After serving here for two years the United States Public Health Service transferred him to the midwest where he spent four years with the Missouri and Illinois State Health Departments developing local health work. In 1925 he returned to Washington to take charge of the venereal disease control work of the United States Public Health Service, a position that he occupied for five years. In 1930 the position of Commissioner of Health of New York State became vacant due to the resignation of the former Commissioner to enter a different type of work. Governor Roosevelt feeling that there was in the state no person who seemed particularly suited for this position at the moment requested the detail of an officer of the United States Public Health Service to serve as Commissioner in New York for a period of years. Dr. Parran was detailed to this work serving with distinction as Commissioner until 1936. That year he returned to Washington as Surgeon General of the United States Public Health Service succeeding Dr. Cummings who had reached the retirement age.

used in the practice of his art and in his head he might carry most of the medical knowledge of his time. Our knowledge of man and dis-

*The discussion here published is not verbatim but contains the essence of the speaker's statements as reported by the chairman.

ease was very restricted for the scientific laboratory had not yet made much progress in the evolution of elaborate tests and therapeutic armamentarium.

Today we find that all of this has changed. Just as the developments of science have added to our knowledge of disease so have they also created problems of prevention. Public health has made great advances in the control of certain specific diseases, notably the infections. It has been relatively simple to control typhoid through attention to the water supply, to prevent diphtheria through immunization, to limit the development of simple goiter through the ingestion of iodine. But with the control of certain specific diseases others over which equally effective control has not yet been established stand out in greater prominence. At times we have been so engrossed with our successes in one direction that we tend to lose sight of equally great problems in other directions.

The attack upon some of these is in large measure a problem of creating individual understanding and participation. Only a few of the public health problems can be solved by such simple expedients as putting a few drops of chlorine in the water. In public health work it is extremely important that individual members of the community should both understand the problems and participate in their solution, for the health of any community is the sum of the health of the individual members of that community. This has meant that those actively engaged in public health work and especially those in public health nursing have had to become teachers.

Another difficulty has arisen from the fact that the prevention of certain diseases necessitates the treatment of the individual. In some instances, as in syphilis and tuberculosis, the treatment has been necessary to diminish the likelihood of spread as well as to benefit the infected individual. In other instances medical service has as yet given us no effective means of prevention, but only methods of treatment to restore the patient to health. Yet it is just as important to the community to restore the sick patient to health as it is to safeguard him from becoming ill. Thus step by step in the development of public health as the simple problems of health have been solved and our attention turned to the more complex problems of community pro-

tection we have become more and more concerned with the manifestation of disease and the necessity of its treatment. We have realized that in our attempts to approach an ideal with respect to both personal and community health we must give attention to the alleviation of those diseases for which we have as yet no effective prevention. Just as the community attempts to safeguard its citizen through its licensing of qualified medical practitioners, so society, which must pay for the ravages of disease, turns to a consideration of all measures which will reduce human suffering and the economic burden from sickness and avoidable death.

During the past years in which we have witnessed unparalleled progress in the science of medicine we have seen an equally significant progress in public thinking about the application of this science. It is very true that medical science has "sold itself" to the public. Certainly the public of today is more interested than ever before in the changes that are occurring within our science. At the same time they are asking themselves to what extent these scientific findings can be put to more effective use and can be made more generally available so that their benefits may reach a greater number of persons. People are demanding that this knowledge which is ours be put to work promptly and widely for the use of all.

On the other hand we have seen some reluctance on the part of medicine to respond to this public demand. This reluctance has not been conditioned by any basic dislike to respond in those fields where the health of the public may be benefited. Yet there has been a very real concern over some of the methods that have been proposed for putting medical science more widely to work. In the various proposals a few salient points of controversy stand out.

Any attempt to bridge this gap between the scientific laboratory and the application of its findings to the health of the nation raises immediately the question of financing. If it is to be a measure of public concern and is therefore to be supported by taxes, there occurs immediately the situation that those who depend on public support receive more than do those who attempt to buy their own services. There is the important problem of distribution of medical care without the danger of too great political control. No one has as yet evolved a simple formula

which will solve these and countless other allied questions, nor is it likely that any formula will be found without the benefit of trial and error. It is necessary in approaching this social problem that we use the same type of experimental method which has given us the principal discoveries of medicine in the laboratory. Unless we experiment with various methods we will learn nothing and no progress will be made in the better application of the findings to the solution of some of our most pressing public health problems. Fortunately we have in our form of government forty-eight or more different experimental laboratories in which we may try out various plans that may be proposed, learning what is good from one and retaining it while discarding that part of another which has been found to be bad. Just as medical progress rests on experimentation so also does social progress.

The national health survey was an attempt to find out and measure some of the health problems of the country so that we might formulate rational plans for trial. It represents the most comprehensive approach that has ever been made to the many problems affecting the nation's health. From the findings of this survey and the proposals of the Interdepartmental Committee there evolved a national health bill. While this bill, the so-called Wagner bill, has many serious defects in its present form, these defects can be remedied. Little can be accomplished by paying money out of several unrelated brackets with no central planning and no adequate review of the needs of the program as a whole. We cannot have a unified health program if we build hospitals with funds from one source, operate them with different funds, use still different funds for the health of the children, others for the medical care of the indigent and still others to protect the health of the worker. It is unlikely that any program that lacks coördination of direction can be successful.

In the execution of any plan for solving current public health problems through the furnishing of more nearly adequate care, two factors are essential. The first of these is trained personnel; without trained and skilled workers, experi-

ments are unlikely to succeed. The other essential is that whatever federal participation is included shall not mean too great federal control or domination. Within reasonable limits the individual states should be allowed to work out their own methods and procedures. It is only by this freedom of planning that we can look forward to that degree of experimentation that is needed and the development within different states of programs best adapted to the local needs. So long as we can have experimentation we may hope for the evolution of practical plans to meet the increasingly important new challenges of the public health.

In the discussion that followed the informal remarks of Dr. Parran, President Ford and Dr. J. C. McKinley commented on the necessity of including problems of mental health. Dr. Parran agreed that all phases of the prevention and care of mental diseases were an essential part of the broad health program of a community and pointed out that such were included in the study and plan of the Interdepartmental Committee.

Dr. A. J. Carlson, commenting on the basis of acquaintance with the situation in the Scandinavian countries and Russia as well as this country, spoke of the importance of so planning that the individual would pay to the extent of his financial capacity. He stressed the dangers of creation of a plan that might tend to relieve the individual of any thought of personal responsibility and to develop a philosophy of utter dependence upon government. Dr. Parran concurred in believing that whatever plan was tried should provide that patients who are able should pay in proportion to their ability. This may lead to a system of insurance to prepare for such costs, possibly including levies upon employer as well as employee. The success of hospital insurance has created new interest in this possibility.

Other participants in the discussion included Professor Stuart Chapin, Dr. H. S. Diehl, Dr. A. J. Chesley, Dr. G. F. Amyot, and Mr. H. A. Whittaker.

CHEMOTHERAPY

Chairman: DR. ARTHUR D. HIRSCHFELDER
Professor of Pharmacology
University of Minnesota

Leader: DR. PERRIN H. LONG
Associate Professor of Medicine
Johns Hopkins University

DR. HIRSCHFELDER: We are celebrating the Fiftieth Anniversary of the Medical School; but though it is only a little past the thirtieth anniversary of the initiation of chemotherapy by Ehrlich's introduction of salvarsan for the treatment of syphilis, we might also celebrate the anniversary of that event. It is about twenty-eight years since Morgenroth with the discovery that ethyl-hydrocuprein exerted a specific action against the pneumococcus conducted the first chemotherapeutic attack upon bacterial diseases. In 1912 I found that although ethyl-hydrocuprein was effective against pneumococcic septicemia in mice it would not cure pneumococcus pneumonia in rabbits and Chesney and others showed that it would not cure human pneumonia. It is interesting that now the workers at the Mellon Institute have carried Morgenroth's work one step further and are finding that hydroxyethylapocuprein which is less toxic than ethyl-hydrocuprein has a definite curative value in human pneumonia. But the great revolution in the chemotherapy of bacterial diseases came a very few years ago when Domagk introduced prontosil and the French experimenters showed that the sulfanilamide portion of the molecule was the part that produced the chemotherapeutic effect. Our distinguished guest, Dr. Perrin H. Long of Johns Hopkins was the first to introduce sulfanilamide in America, and he and Dr. Marshall by introducing methods of precision into the use of this wonderful drug, and the related substances, have done the most to add to our knowledge of how they act and just how they should be administered. I have the honor of introducing Dr. Perrin Long.

DR. LONG: The average case fatality rate in lobar pneumonia in the Johns Hopkins Hospital during the past few years has been 20 per cent. Despite the use of new and more effective anti-pneumococci sera, the case fatality rate has not been appreciably lowered during the last three years. During the past year, since July 1, 1938, following the use of serum and sulfapyridine and sulfapyridine alone, the case fatality rate

DR. PERRIN H. LONG is associate professor of medicine at Johns Hopkins University, in charge of the bacteriological division of the Department of Medicine. Dr. Long graduated in medicine from the University of Michigan in 1924. During the period from 1927-29, he was first assistant, then associate at the Rockefeller Institute for Medical Research in New York. Because of his valuable contributions in the field of infectious disease, he was then invited to become a member of the department of medicine at Johns Hopkins University. First as an associate and later, after promotion to the rank of associate professor, Dr. Long continued to carry on important investigation in clinical bacteriology and infectious disease. He was the first to point out to the medical profession in the United States the value of sulfanilamide in the treatment of various infections, notably those due to the streptococcus. His intensive research and numerous publications dealing with various aspects of sulfanilamide therapy have been of major importance in quickly bringing this valuable remedy into general use.

in pneumococcal infections in the Johns Hopkins Hospital has been cut to 7.2 per cent. This is the lowest in the history of the hospital. Since July 1, 1938, we have treated thirty-one patients with anti-pneumococci serum, eight with serum and sulfapyridine and 126 with sulfapyridine alone. In this group of patients, two were suffering from pneumococcal infections in which the pneumococci proved to be resistant to sulfapyridine therapy both in the clinic and in experimental animals. It has been shown that sulfapyridine given by mouth may be irregularly absorbed by different individuals and also that certain individuals acetylate the drug to a high degree. Hence, therapy with sulfapyridine by mouth is more difficult than when sulfanilamide is used. It has been our practice in adult patients to use the following dosage schedule. As soon as the diagnosis of pneumonia is made, the patient is given 4 grams of the drug in a single dose, then 1 gram is given every four hours until the temperature has been normal for forty-eight hours, then 1 gram every six hours until resolution is well under way, and finally 0.5 grams four times a day until the lungs are clear. It has been our practice on the day following the admission of a patient to the hospital to give the sodium salt of sulfapyridine by the intravenous route if the patient's temperature is not below 101° by rectum and the concentration of free

sulfapyridine in his blood is below 4 mgm. per cent. If such is the case, a single dose of sodium salt of sulfapyridine based on 0.06 grams per kilogram of body weight and made up in a 5 per cent solution in distilled water is given by the intravenous route. This dose will raise the blood concentration of sulfapyridine by about 5 mgms. per cent. If a patient is severely ill on entry into the hospital, we generally start therapy with an intravenous dose of sodium sulfapyridine based on 0.06 grams per kilogram. This may be repeated in four hours if necessary. Oral therapy is carried on as previously outlined with the exception of the omission of the initial dose. A further example of the effectiveness of sulfapyridine and sodium sulfapyridine in pneumococcal infections may be gained from the experience of Dr. Horace Hodes of Sydenham Hospital in Baltimore. During the past year, he has treated seventeen cases of pneumococcal meningitis with sulfapyridine given by mouth alone or in conjunction with the sodium salt administered by the intravenous route. Of these seventeen patients, eight have recovered. Of those patients who have recovered, seven were treated with the sodium salt by the intravenous route as well as by sulfapyridine. It is our practice now to establish blood concentrations of 15 to 20 mgms. per cent in pneumococcal meningitis by administering an adequate amount of the sodium salt of sulfapyridine by the intravenous route. This concentration is maintained until the temperature has been normal for from twenty-four to forty-eight hours. Oral therapy is also started as soon as is possible. Sodium salt of sulfapyridine cannot be given by the intraspinal route because it causes a severe myelitis which is frequently fatal. It can only be given by the intravenous route.

DR. GEORGE E. FAHR: Can the administration of alkali prevent hematuria and formation of stones?

DR. LONG: Theoretical consideration would lead one to believe that if the urine was kept very alkaline, pH 7.5 to 8, that the precipitation of acetyl sulfapyridine crystals would be decreased. Hence it would be less likely that renal stones would be formed.

DR. ERLING S. PLATOU: May the drug be used by the intrathecal route?

DR. LONG: Never by the intrathecal route.

DR. FAHR: You can usually tell very promptly if the treated patient is going to make a quick response to sulfapyridine.

DR. LONG: That is our experience. Improvement comes rapidly and should be marked within forty-eight hours. During the past year, we have had a large experience at the Sydenham Hospital with pneumonia secondary to measles. In this type of measles, sulfapyridine is highly effective and as Dr. Hodes has reported the drug brings about a spectacular improvement within thirty-six to forty-eight hours.

Dr. Hodes has also reported that the drug is of definite value in the therapy of whooping cough pneumonia. Some one has asked me if the drug is valuable as a prophylactic agent. Only under exceptional conditions should sulfanilamide or sulfapyridine be used as a prophylactic agent. Our experience leads us to believe that the only instance of proven prophylactic value of sulfanilamide is in the treatment of crushing wounds and compound fractures. In these types of injuries, the administration of sulfanilamide in full prophylactic doses prevents gas bacillus infections and facilitates markedly the healing of the wounds.

DR. FAHR: On account of the fact that Dr. Bieter found that too large doses causes too high blood levels in mice which was harmful to the mice, I keep the blood level of sulfapyridine in my patients at about 5 mgms. per 100 c.c.

DR. THOMAS MYERS: Do increases in the concentration of the drug in the blood increase the incidence of toxic effect?

DR. LONG: Not as far as we know. We have noted that children are more prone to develop leukopenia when they are receiving sulfapyridine than is the case when sulfanilamide therapy is being used.

DR. DONALD C. CREEVY: How about post-operative pneumonia?

DR. LONG: We employ sulfapyridine in our patients in whom the clinical diagnosis of pneumonia has been made, so this includes the post-operative pneumonia. We feel that if an attempt is made to make a definite bacteriological

diagnosis before instituting treatment that valuable time will be lost.

DR. FAHR: What has been your experience in trying to retype pneumonia in the course of sulfapyridine therapy? We have sometimes found it difficult to retype the organisms found in the sputum.

DR. LONG: This has not been our experience. We do not feel that sulfapyridine therapy interferes with the subsequent typing of pneumococci in the sputum.

DR. CREEVY: Do you use sulfapyridine in the urinary tract diseases?

DR. LONG: We have not used sulfapyridine because of its high acetylation rate in the urine.

DR. MYERS: When would you stop treating a case of otitis media?

DR. LONG: We think it best to continue sulfanilamide for at least two weeks after a complete clinical cure has been effected. During this period but small doses should be given. We have had very few mastoids develop in our nose and throat patients ill with hemolytic streptococci otitis media since we instituted the routine use of sulfanilamide in the treatment of this disease. It is of importance when continuing treatment to watch the white blood cell count. Acute hemolytic anemia generally makes its appearance within the first five days of therapy with sulfanilamide, while agranulocytosis most frequently occurs after ten days of therapy and generally from the seventeenth to the thirtieth day of treatment. Hence it is important to follow the white blood cell count as long as sulfanilamide therapy is being continued.

DR. HAROLD N. WRIGHT: The present intense interest in the chemotherapy of bacterial diseases must, necessarily, carry over some of its advances to other forms of chemotherapy, and particularly to the treatment of protozoan and meta-zoan infections, especially the treatment of syphilis.

One of the important facts brought out in the clinical use of sulfanilamide in the treatment of pneumonia is the necessity for maintaining an effective concentration of the drug in the blood stream throughout the period of treatment.

The usual plan of antisyphilitic treatment with arsenical drugs, namely eight to ten injections at five to seven day intervals, requires at least eight to ten months continuous treatment in order to render the disease non-communicable.

Following a single intravenous injection of one of the arsphenamines an effectively spirocheticidal concentration of the drug can be maintained in the blood stream at best for a matter of hours.

The avoidance of toxic reactions, particularly the cumulative effects of the arsphenamines, has been the principal reason for the comparatively discontinuous form of therapy. It is true, of course, that the complete excretion of a single dose of any of the arsphenamines may require fourteen to twenty-one days. The prolonged retention of these drugs is, however, closely connected with their colloidal properties, the therapeutic properties being roughly inversely proportional to the degree of colloidality. I see no reason why it should not be possible in the not too distant future to manufacture the arsphenamines in such a way that their antisyphilitic properties may be enhanced from four to ten times, in all probability with less danger of cumulative effects than at present. Mapharsen, which probably possesses no colloidal properties whatever, we have found in rats to be 80 per cent excreted in the first twenty-four hours.

Hyman and his collaborators in New York appear to have shown that much more rapid disappearance of the symptoms of early syphilis can be obtained by practically continuous intravenous infusion of the arsphenamines for a period of five days, the disease being rendered non-communicable and 86 per cent of the cases becoming seronegative in an average time of twelve weeks. Although this work is still only in the experimental stage, it points to the necessity for further investigation of the optimum conditions for the administration of arsenical antisyphilitic drugs.

DR. N. K. JENSEN: In all compound fractures treated at the General Hospital since March of 1938, we have placed sulfanilamide powder in the wounds upon the completion of debridement. The wounds have then been closed with skin sutures only, and the fractures completely immobilized. To date seventy-five fractures have been so treated. Infection has occurred in only four of these wounds, giving a percentage of infection of 5.3. In the first forty-

one cases so treated, only one wound became infected. These cases were reported in the journal *Surgery* for last July. Two of the wounds that became infected were so extensive that satisfactory closure could not be accomplished due to loss of skin. In another instance, the patient had a recurrence of his compound fracture eight days after injury while maniacal in delirium tremens. The fourth infection occurred in association with internal fixation of a compound fracture of the ulna; our only attempt at internal fixation of a compound fracture. No gas gangrene or tetanus infection has occurred, and the infections have been mild.

Before the use of sulfanilamide locally, the incidence of infection in compound fractures treated at the General Hospital during the last five years ranged from 26 to 30 per cent. In 1937 alone, five patients developed gas gangrene. The statistics for each year previously have shown approximately the same incidence. Besides these cases developing gas gangrene, it has been found necessary in the past to perform several amputations each year because of infections resulting from compound fractures.

We have found that by local introduction of sulfanilamide powder directly into the fresh wound, the concentration of the drug in the extent of the wound can be maintained at levels approaching saturation (800 mgm. per cent) for approximately thirty-six hours. Experimental study in animals reveals that an equal amount placed directly in a contaminated wound is much more effective than given parenterally at a separate site. In this series of patients reported no other sulfanilamide therapy was used.

Dr. King's findings that a small amount of autolyzing tissue inhibits the action of sulfanilamide suggests that all devitalized tissue must be removed from the wound. This we have found to be true, both in our clinical and experimental study.

DR. JOSEPH T. KING: The group using tissue cultures in the study of the effects of the sulfonamide compounds on the streptococcus includes Dr. Henschel, Mrs. Green and myself.

We have observed that strains of beta streptococcus grow in tissue culture clots in two forms. Some strains grow as dense colonies showing no diffuse periphery, while the colonies of other strains show a dense center and wide diffuse

periphery. This periphery is not composed of long chains of streptococci but of single organisms or small groups of two or three.

The response of the two colony types of sulfanilamide differs. In the living state, at a magnification of 60X, the compact type of colony shows no characteristic qualitative change; it is simply smaller. When the colony with diffuse periphery is treated with sulfanilamide the normal periphery is completely inhibited. Occasionally such an inhibited colony will show a few long, thick chains growing, usually from a small segment of the periphery. In older cultures one may rarely find a colony showing a complete periphery of such chains. Such a periphery is easily distinguished, even in the living state, from a normal diffuse periphery.

On the basis of colony diameter the inhibition is more striking in the case of strains whose colonies grow with diffuse peripheries. One can hardly escape the impression that the drug inhibits the invasion of the clot by the organisms.

It has also been observed that effects of sulfanilamide are antagonized by the products of tissue disintegration. If small fragments of fresh, sterile tissue are planted in tissue culture clots inoculated with a suitable dilution of a strain of beta streptococci showing diffuse peripheries, it has been found that sulfanilamide fails to produce typical inhibition of the periphery of those colonies close to the fragment while colonies further away show the expected inhibition. Not all tissues are equally effective in producing this "release" of colonies from sulfanilamide inhibition. There is evidence, however, indicating that even those tissues which are least effective in preventing the qualitative response do interfere with the bacteriostatic property of sulfanilamide. Studies on this point are in progress.

It was shown by Lockwood that peptones reduced the bacteriostatic effect of sulfanilamide for the streptococcus. Hoyt and Levine found that peptones interfered with the bacteriostatic effect of sulfapyridine on the pneumococcus.

The adsorption experiments of Larson, Bieter, Levine and Hoyt suggest that peptones and certain amino acids interfere with the adsorption of sulfapyridine.

It is evident that such products would be liberated by tissue undergoing proteolysis, and, while the precise mechanism by which such substances interfere with the activity of the sul-

fonamide compounds is not entirely clear, it is important to realize that disintegrating tissue protects the streptococcus from the action of sulfanilamide.

DR. RAYMOND N. BIETER: In our work on chemotherapy using Type II pneumococcus in mice, we have come to believe that the following factors are important and are to be considered:

1. Compounds or a series of compounds of related or unrelated chemical structure should be studied in a sufficient number of mice of the same strain to be statistically significant. To help answer the question of how many mice are necessary for one experiment, we have made use of the studies of Halvorson and Ziegler. They have attempted to show how the change in error varies with the number of times an experiment is repeated. Their experiments consisted of a study of bacterial growth in vitro. They have found that if one goes from a relatively few experiments up to about 30 repetitions, a rapid decrease in the percentage of error due to chance occurs. Above thirty the decrease in error due to chance takes place much slower. In other words if an experiment is repeated thirty to forty times, chance is eliminated to a high degree, and in order to get a marked improvement over thirty to forty repetitions of an experiment, one must go well up into the hundreds.

2. When chemotherapeutic drugs are used clinically they must be used against a wide variety of strains of a single organism. Therefore, it behooves investigators to study the actions of these drugs on as many strains of a given organism as possible. It is well known today that sulfanilamide has a more marked action on certain strains of the beta hemolytic streptococcus than in others. Undoubtedly this effect will be noted with this and other drugs acting also on other bacteria.

3. For the most quantitative results, surely it is agreed that the dose of infecting organisms given to an experimental animal should be described in terms of the organism's M. L. D. (minimum lethal dose). For mice this can be easily determined by simply injecting a suitable number of these animals. It is our belief that the M. L. D. in terms of dilution alone is not enough, but that these inoculations be paralleled

using an organism count. Many different multiples of the M. L. D. are used by the investigators, but as yet no one knows the optimum number of M. L. D.'s to use. In most of our work, we have used from 4,000 to 8,000 M. L. D.'s of our Type II pneumococcus.

4. The age of the culture used for inoculating mice or other animals is perhaps of paramount importance. It is well known, for example, that a culture of pneumococci aged from eighteen to twenty-four hours can be more easily phagocytized by human leukocytes than a younger culture. This difference may result in a different chemotherapeutic picture in the experimental animal. In our work with the Type II pneumococcus, we have adhered to the principles laid down by Chesney, Ward and Ender, and Neufeld and Handel. That is, actively growing young cultures are most resistant to phagocytes, and when explants of these cultures are made, maximum growth occurs. Alternate passage through mice and artificial media assures uniform virulence. An eight-hour culture satisfies the conditions of maximum virulence and no lag in growth.

5. The experimental technic best suited to each organism should be worked out and used for each bacterium. For example, in pneumococcus infections in mice, it appears to us that the subcutaneous method of inoculation is superior to the intraperitoneal method. This is believed to be true for the following reasons:

- a. Human pneumonia for the most part is a localized infection. The subcutaneous inoculation of mice with Type II pneumococcus results in a localized infection in the mice lasting about twenty hours, as compared to less than one-half hour following intraperitoneal inoculation.
- b. This then results in a *in vivo* experiment more equivalent to the average speed of a human pneumonia infection.

6. To obtain data most satisfactory for statistical treatment, the death times of mice should be determined quite accurately. We have, therefore, determined the death rates in our mice more or less on an hourly basis. In addition, by this method, smaller differences between chemotherapeutic substances can be noted which would not appear on a day to day determination of death rate.

7. In all of our work to date, we have employed the method of drug administration by simply mixing the pulverized drug with ground food and giving it to the mice in waste-proof food cups. This method has several advantages.

- a. It is very simple and easy to use.
- b. When the mice are once inoculated, no further handling is necessary. We have found that repeated handling of mice interferes with their food intake. Therefore, when mice are injected repeatedly with a drug, the element of starvation may play a rôle.
- c. We have found that mice eat quite regularly during six hour periods both day and night. Their food intake is greater during the night than during the morning. Other than for this variation, their food intake tends to run quite uniform per twenty-four hours after the first day or two. It requires one or two days for the mice to become accustomed to the food cups and thereby assume their maximum food intake per twenty-four hours. By weighing the food at twenty-four hours or shorter intervals, the drug intake can be easily computed. Inasmuch as Marshall and his collaborators have found that a mouse eliminates a given dose of sulfanilamide in about six hours, we believe that our method of food plus drug administration is superior to all other forms of drug administration unless the drug is given at intervals of six or fewer hours. Further reason of the efficacy of drug administration is to be found in the results we have obtained with sulfanilamide and its derivatives on Type II pneumococcus infections in mice. These results can be briefly summarized as follows: With 0.5 per cent of each of the following drugs in the food cups of 50 mice, each showed the following survival rates at thirty to sixty days.

- a. Control group..... 0 survivors
- b. Neoprontosil 6% survivors
- c. Sulfanilamide 20% survivors
- d. Sulfapyridine 44% survivors

The question of why survival rates in inoculated mice uniformly seldom approach 100 per cent has interested us very much. Undoubtedly a number of factors in the animal body of which

we know little play great rôles. One of these has to do with the temperature of the animal. This is especially important because of the observations of White to the effect that when the temperature in vitro studies is raised above 37° C., the bactericidal effect of sulfanilamide and its derivatives becomes greater. We have first of all constructed a micro-thermocouple using a copper constantine junction. This is made small enough so that it can easily be inserted beneath the mouse's skin. The mouse is held in the left hand as if one were to make an intraperitoneal inoculation. In a large series of normal mice, we have found that their normal temperatures most often run between 100 and 101° F. If now a group of mice are given an intraperitoneal injection of our Type II pneumococcus, the temperature begins to drop at about five hours and then thereafter shortly drops precipitously to about 85°. On the other hand, when the organisms are given by subcutaneous inoculation, the temperature begins to drop at seventeen to twenty hours and soon thereafter drops precipitously. As can be seen, the time elements correlate with our observations on blood stream invasion. It should be noted that at no time have these mice shown an elevated body temperature. Another factor that we have found is that mice appear to be very susceptible to environmental temperature changes. For example, mice placed in an environment at 37° C. show a 2° F. rise in half an hour. In addition to these preliminary findings, we have also collected the following preliminary observations:

- a. Control mice inoculated with our Type II pneumococcus and placed in an incubator at 37° C. die more rapidly than if kept at room temperature.
- b. Mice on 0.5 per cent sulfanilamide in the food and placed in the incubator show a more rapid and greater death rate than an equivalent number of mice maintained on the same amount of drug at room temperature. The sulfanilamide intake in both groups was approximately the same. We know further that normal mice and mice on sulfanilamide in the food maintained in the incubator showed no toxic effects. These experiments in the incubator were conducted with from 15,000 to 20,000 M. L. D.'s of our Type II pneumococcus per mouse. It can be seen, therefore, that

the survival rates or therapeutic effects at $37\frac{1}{2}^{\circ}$ C., that is in the incubator, are not as good as in mice at room temperature. In other words, these results do not all parallel the in vitro observations of White.

DR. WESLEY W. SPINK: At the University Hospital, we have been interested in certain toxic manifestations of sulfanilamide and sulfapyridine.

In association with Drs. C. J. Watson and I. Vigness, the problem of cyanosis due to sulfanilamide has been studied. Spectroscopic analyses of the bloods of several of these patients showed that in every instance the cyanosis was due to the presence of methemoglobin and, rarely, sulfhemoglobin. The intravenous administration of a 1 per cent solution of methylene blue to these cyanotic patients was followed by the disappearance of the cyanosis, and the characteristic absorption band of methemoglobin was found to be absent in their bloods. Methylene blue had no effect upon sulfhemoglobin. We have quantitated the amount of hemoglobin converted into methemoglobin in patients with cyanosis by spectrophotometric and spectrophotometric methods. In markedly cyanotic patients as much as 30 per cent of the hemoglobin was found to be present as methemoglobin. Clinical observations lead us to conclude that sulfapyridine seldom causes cyanosis. The blood of one patient with a slight degree of cyanosis was found to have 7 per cent of methemoglobin. After methylene blue had been given, the cyanosis abated, and methemoglobin could no longer be demonstrated in the blood.

Dr. Watson and I have studied the pigment metabolism and liver function of patients receiving sulfanilamide and sulfapyridine. Using quantitative methods, we have found that the majority of patients receiving therapeutic doses of sulfanilamide or sulfapyridine for several days will develop some anemia. In some patients it is of marked degree. It is of interest that this anemia is of macrocytic or normocytic hypochromic type. This, in conjunction with the usual finding of a very significant increase in feces urobilinogen, indicates not only an increased destruction of erythrocytes, but a disturbance or retardation of hemoglobin formation. An analogous situation is found in lead poisoning. Sixteen patients receiving sulfanilamide

developed jaundice. We have not observed jaundice in any patient to whom sulfapyridine was given. We regard jaundice as an indication of liver dysfunction. In addition to the jaundice, the Van den Bergh reaction was prompt or biphasic, and the serum bilirubin was elevated. Further evidence of liver dysfunction was the increased excretion of urobilinogen in the urine. Jaundice was not observed in any patient who received less than 3 grams of sulfanilamide a day. We have not encountered any patients where extensive liver damage due to sulfanilamide alone was the cause of death. However, four of our patients had serious hepatic injury because of infections, and we are certain that sulfanilamide therapy accentuated the process, and hastened a fatal outcome. We are very reluctant to give sulfanilamide to any one with jaundice, and have done so only in a few instances. For the most part, the liver dysfunction is only temporary, and returns to normal after sulfanilamide therapy has been stopped.

DR. E. N. COOK: We are all greatly interested in the opportunity to hear Dr. Long discuss the use of sulfanilamide and its derivatives in the field of chemotherapy. In the short time allotted to me today I wish to call your attention to the excellent results we have obtained in the use of sulfapyridine in the treatment of gonorrhea.

The usual gastro-intestinal upsets so frequently seen when this drug is administered are greatly diminished in our experience, because of the fact that in most cases we use only 45 grains daily, and by splitting the dose and giving it with milk each time these untoward reactions have been very infrequent.

We have used sulfapyridine in the treatment of the acute and chronic Neisserian infections with equal results. Almost always the discharge disappears in three to five days, and as soon as this takes place it has been our custom to begin local therapy, including massage of the prostate. With no other form of therapy have we seen such spectacular results as we have noted in patients suffering with gonorrhea who have been treated with sulfapyridine. In no instances have we seen blood dyscrasias, but on two or three occasions when giving a second course of the drug we have noted a dermatitis similar to that seen when sulfanilamide is administered. In

each case it cleared up rapidly upon discontinuing the sulfapyridine.

If the 45 grain dosage does not bring about the expected results in five days, we would advise increasing the dosage to 60 grains daily and continuing it for a period of seven to ten days in addition to the previous five days of therapy with the smaller dosage. English observers have stressed the importance and value of local therapy in conjunction with sulfapyridine by mouth.

DR. ERLING S. PLATOU: With the collaboration of Dr. Wallace Sako and Dr. Paul Dwan I have treated two hundred cases of scarlet fever with sulfanilamide at the Minneapolis General Hospital in the past two years. The drug was usually administered orally in initial doses of 0.05 grams per pound of body weight per twenty-four hours and maintenance doses of 0.03 gm. in twenty-four hours. The dosage was usually decreased but the drug was continued for an average of twelve days. In patients with nausea or severe toxemia we gave the drug subcutaneously in the form of the one per cent solution in sodium chloride. It is our impression that, per unit of weight, children tolerate the drug better than adults. With the exception of the development of leukopenia in two cases and fever and rash in two additional cases in which we were compelled to discontinue the use of the drug, no serious complications were encountered.

In 1938 we reported the results in 100 treated cases, compared with 100 control cases which were admitted to the hospital during the same period. In our treated cases the rate of recovery from the acute toxemic phase of the disease

(six days) was no more rapid than in the controls (six days). The patients treated with sulfanilamide did not show prompt subsidence of toxic symptoms such as we have observed following the administration of serum. However, in the cases treated with sulfanilamide the incidence of complications was only 8 per cent, as compared with 41 per cent in the control series. We believe that the best results were obtained when sulfanilamide was continued during the entire convalescent period and that early discontinuance of the drug was the cause of the appearance of complications in a few of our cases.

Since 1938 we have treated 100 additional cases with sulfanilamide, and the incidence of complications remained the same as in the previous series. During this period we have seen a number of rather severely complicated cases to whom physicians had given adequate dosage of sulfanilamide early in the disease only to discontinue it when the temperature reached normal. Continued therapy for at least twelve days has proved to be effective in preventing such eventualities.

Sulfanilamide also seems to have a prophylactic effect in preventing the development of scarlet fever. We have given therapeutic doses for seven days to ninety-four intimate "contacts." None of them developed scarlet fever but three developed severe cervical adenitis. None of the contacts who received both convalescent serum and adequate sulfanilamide treatment developed either scarlet fever or its complications, but we have seen seventeen cases of scarlet fever which developed after the prophylactic use of sulfanilamide in inadequate dosage.

CLINICAL ASPECTS OF THE VEGETATIVE NERVOUS SYSTEM

Chairman: DR. FRANK C. MANN

Professor of Experimental Medicine
The Mayo Foundation, Rochester, Minn.

Leader: WALTER B. CANNON

Professor of Physiology
Harvard University

DR. MANN: We are very fortunate in having with us as the leader of this discussion the man who has done probably the most of any other from the physiological standpoint, in giving a certain amount of basis for the clinician's viewpoint that the vegetative nervous system does have something to do with clinical medicine.

Now there are many titles by which I could introduce the leader of the discussion. I might introduce him as a home-town boy, because we are all happy to own him as a Minnesotan. I might also introduce him as the first roentgenologist, because historically that would be a true title to give him. However, I shall introduce him as I have always thought of him since the time I first entered physiology and studied the fine type of work he did on the pylorus and the use of the x-ray for visualizing the gastro-intestinal tract, namely, as the professor of physiology of Harvard University. Professor Cannon.

WALTER CANNON: I've had very little experience with round tables; I've seen round tables of various shapes; I think this is the strangest shape of a round table that I've ever come across. A round table, I presume, is given that name because it was expected that there would be a sort of family feeling among those who are gathered, and that the discussion would be an informal one.

In order that we may be reminded of the subject under discussion, I'm going to ask for the first lantern slide which will present a diagram of the autonomic system. Here are the central axis, the spinal cord, the cranial division above the medulla, the sacral division below the sacral enlargement of the cord, and the thoracico-lumbar divisions between the sacral and the brachial enlargements. On either side, of course, there are the chains of ganglia connected by the pre-ganglionic fibers with the spinal cord, and the post-ganglionic fibers reaching out to the nictitating membrane, to the heart, to the liver, to the stomach and intestines, and to the adrenal medulla which, as you know, produces a substance

DR. WALTER B. CANNON of Harvard University is the accepted dean of American physiologists. For the last forty-one years, ever since his first publication in the very first issue of the *American Journal of Physiology* in 1898, on the movements of the stomach as observed by means of Roentgen rays, Dr. Cannon has made outstanding contributions to physiology which have been of tremendous significance in the development of medicine, pharmacology, and psychology. His major interest has always been the influence of the autonomic nervous system on the functions of the organism, which has led him from control of the stomach through emotion, hunger, surgical shock, exercise, and homeostasis to his most recent achievement: the discovery of humoral transmission at the endings of the sympathetic nerves. This year he has been honored by his fellow scientists, who elected him president of the American Association for Advancement of Science.

imitating in its effects all the effects which are brought about by sympathetic nerve impulses. So we may regard this as a sympathal adrenal system.

Now we are to be concerned mainly today with the functions of this sympathal adrenal system in relation to clinical interests. You will find in a book by Miller, a rather large compendious work, these nerves referred to as layman's nerve as if they were absolutely necessary for life. The next lantern slide will show you a cat with her two kittens. Here she is with her paw lifted, her teeth showing, her ears back because a dog is barking at her; there's no hair rise here because the conveniences for hair rise are up here on the chart. This is the sympathetic system of this cat. Here are the two chains from the superior cervical sympathetic ganglion on either side, here down to this other ganglion in the upper part of the thorax, then the splanchnic coming off here to the celiac superior mesenteric ganglia and the sympathetic—and the abdominal chains reaching down to the pelvis. There is the possibility of these ganglia to some degree being omitted if the chains were taken out in piecemeal as in this case, so we devised the method of taking them out whole as the next lantern slide will show. Here are the two—here are chains taken out complete from the stellate ganglia high in the chest down to the rim of the pelvis. These are the splanchnics

coming off here. What inference can we draw from that situation? In the first place it proves that there is no danger to life.

In the next lantern slide is a cat from which the sympathetic system was removed entirely and this photograph was taken of the cat three years after the system had been taken out. There is no danger to existence in removal of any part of the sympathetic system because these experiments show it's possible to remove the entire system and individuals continue to live for an indefinite period. It is true not only of horizontal animals like the dog and the cat but also true of monkeys that take the upright position.

Furthermore, it is compatible with growth. This system is often spoken of as the vegetative system, and the implication there is that it is concerned with growth. We have, however, removed the system on one side from kittens and allowed them to grow to adulthood and then examined carefully various organs which are bilaterally symmetrical in size; and in those circumstances have not been able to find any difference on the two sides as a consequence of the absence of the sympathetic on one side and its presence on the other.

That's another point which can be made; it's quite possible that operations on the sympathetic might be done on young children and there'd be no danger doing that sort of operation because of fear that growth might be interfered with. It is not interfered with.

It is compatible with reproduction in the female, as the next lantern slide will show. Here is a bitch from which the sympathetic is removed and this is one of nine offspring. There is a rather infantile uterus as a consequence of removal; and there is a serious defect in lactation. This animal had a litter of nine puppies and this is the only one that survived; and it survived because it was particularly vigorous and by pressing and tugging and sucking it managed to get enough milk so that it lived to an age which allowed it to drink milk from a pan. The others all succumbed. The nipples of the dog were hard and dry and the only substance which could be got from them was a very thick creamy substance. As soon as this pup was able to drink milk the curve of growth which we had followed immediately began to rise sharply and it wasn't long before it had reached the usual growth curve of the growing dog.

Apparently when the sympathetic control of the blood vessels of the mammary gland is absent there is a failure of the blood vessels to dilate during nursing and therefore the fluid which is used to carry out the substantial part of the milk is not present and the young, therefore, do not get the nourishment which they should have. Operations on the thoracic part of the sympathetic are very likely to have serious effects so far as lactation is concerned. Then there is a defect which results when the sympathetic of the male is removed from the lower abdominal region.

Bacq, working in the Harvard laboratory, clearly showed that in rats and in rabbits the mating processes would occur in the male up to the point of ejaculation, and at this point there was failure, so the males were sterile. That observation was apparently not known by some surgeons and operations were performed which resulted in precisely that effect in human cases. A point which, of course, ought to be clearly kept in mind when the sympathetic system is interfered with.

It is quite possible to have the entire sympathetic system out of the picture and still have a fairly normal blood pressure. That was first shown by Bradford Cannon, my son, in the Harvard laboratory and later was confirmed by Phemister and collaborators in Chicago. The next lantern slide will show their record in which there was complete sympathectomy and you observe that after the final operation the blood pressure varied between 100 and 120 millimeters of mercury.

In a dog it is quite possible for the animal to exercise vigorously within a short time after the sympathetic has been removed without any serious fall of blood pressure. In a cat, this does not occur at once. The next lantern slide will show what happens; if there is struggle the blood pressure falls instead of rising. Here is a typical rise of blood pressure which accompanies vigorous muscular activities; but in the cat, there is a fall. The same thing happens in the dogs in the first week or so after removal of the sympathetic, but after that a recovery takes place and the animal may exhibit even the violent, vigorous actions of fighting with a perfectly normal dog without showing any signs of defect so far as blood pressure is concerned. This, of course, is if the entire sympathetic is removed.

I don't believe that there would be any serious interference with blood pressure in man on removal of a very considerable part of it.

Now there is another effect which is interestingly related to old clinical observations and that is the effect of the sensitization of the smooth muscle which is deprived of its sympathetic control. Here are the contractions of the nictitating membrane in response to various amounts of intravenous injections of adrenalin diluted 1 to 100,000. This is immediately after resection of the right cervical sympathetic and the removal of the left—the removal of the left ganglion here and the section of the right pre-ganglionic fibers above. At the end of fourteen days the same doses which previously produced these effects now produce these effects. You observe on the side from which the superior cervical ganglion was removed, the smooth muscle nictitating membrane of the cat gave a very much larger response than it did before and to a lesser degree there was a magnification of response on the other side where the preganglionic fibers had been severed. Now the superior cervical ganglion was removed on this side and fourteen days after the second operation, twenty-eight days after the beginning, you observe that there was a greater effect here, indicating a greater sensitization on that side.

The next lantern slide will bring out these same facts graphically. This is a course of sensitization of the smooth muscle of the nictitating membrane, with a consequence of removal of the post-ganglionic fibers, the direct innervation; and here is the effect of merely cutting the pre-ganglionic fibers, disconnecting the smooth muscles from the central nerve systems but still having it connected with the fibers coming out from the superior cervical ganglion.

Now, you observe that the results are similar to that produced by the ganglionic removal on the other side.

Now, that's a very important observation because of the fact that when an operation is done on the sympathetic there still remains the adrenal gland which I called your attention to earlier as the source of a substance which is capable of stimulating the smooth muscle which is affected by this adrenalin given off from the adrenal medulla.

There is a case on record that occurred at the Massachusetts General Hospital. A sur-

geon was very much interested in a patient, a woman, who had Raynaud's disease. He had removed the ganglia connected with the muscles that were in spasm and the contracted blood vessels of the fingers had changed from being blue, cold, and painful to a condition of being warm and pink, and comfortable. He took a lot of medical students, strange medical students, to the patient's room shortly thereafter, and with a good deal of dramatic vividness he described the operation which had been performed. And then in order to have a good show he swept down the coverlet to show this hand and there it was as blue and cold as it ever was. He was very much chagrined and went back to the office and told the tale. It happened that Norman Freeman, a young surgeon who had spent a couple of years in our physiological laboratory recognized the possibilities and suggested that he take another look. He went back and looked at the fingers and there they were nice and warm and pink again. Well, then they introduced into the veins of this patient adrenalin at the rate of its ordinary production in times of excitement, and the fingers turned blue; or if they gave insulin and caused a discharge of adrenalin from the adrenal medulla, again the blue, or cold condition appeared.

Now what the surgeons are doing at the present time is not to remove the ganglia directly connected with the smooth muscle of the blood vessels but they cut the pre-ganglionic fibers which run out from the central nervous system to the ganglia so that there is a separation of the muscles from the central nervous system, and there is not so great a sensitization of the smooth muscles to the circulating adrenalin.

Now from the experience which we've had in the laboratory, there is only one defect to that situation and that is the possibilities of regrowth. The pre-ganglionic fibers, as we've learned to call them, are cholinergic fibers; that is, they give off at their terminals acetylcholin and the post-ganglionic fibers to the blood vessels are adrenergic fibers and they give off at their endings adrenalin. You cannot connect adrenergic fibers to cholinergic fibers. You can, however, connect cholinergic fibers of any sort with any other. For instance, cholinergic fibers of skeletal muscle can be connected with these

ganglia and they will then operate. If, therefore, you disconnect the nerve of the smooth muscles by cutting the post-ganglionic fibers, the fibers beyond the ganglia, there is no possibility of regrowth. On the other hand, if you cut the pre-ganglionic fibers almost any other fiber in the neighborhood will make connections there and it is very characteristic of the ordinary pre-ganglionic fibers to make the connections which they've had previously.

Repeatedly, we have had occasion to note connections with the celiac ganglion and the upper part of the abdominal cavity after we've cut the splanchnic nerves and even cut out a considerable part of the splanchnic connection; and recently we've shown that the nerve fibers coming through the stellate up into the inferior cervical ganglion will regrow through several centimeters of empty space, even after efforts were made to prevent precisely that thing happening. That's something that ought to be looked into. This regrowth is so remarkable that it almost seems as though there were courses which the nerves took in spite of everything that you did to prevent regrowth taking place.

There's been a good deal of talk about periarterial sympathectomy; that is the possibility of removing sympathetic control of blood vessels by cutting through the outer layers of blood vessels. Along the length of the blood vessel there may be a slight enervation up and down but not to a great degree. The effect, therefore, when this is done is a local one.

Another matter of considerable interest, clinical interest, that's been brought out by operations in complete sympathectomy, is the differentiation between two types of hypertension. You've all become acquainted with the hypertension which is produced by the application of the Goldblatt clips reducing the amount of blood flow into the kidneys. Now that's a type of hypertension which is not affected by complete sympathectomy. Freeman, whose name I mentioned earlier, and Page have shown that after that sort of hypertension, you may call it renal hypertension, has been produced you can remove the entire sympathetic system without altering the hypertension to any degree whatever. Or you can take an animal like this dog that I showed you without any sympathetic system in it, and apply the Goldblatt clips and produce typical hypertension.

On the other hand, the next lantern slide will show that if the carotid sinus nerves are severed and the depressor nerve is cut there develops a hypertension, in this case running up from approximately 120 millimeters of mercury to the neighborhood of 300, a hypertension which persisted here, as you observe, for many months, for two years; when the entire sympathetic system was removed from this animal, the blood pressure came down as you observed to normal limits. So you must learn somehow to distinguish between hypertension of renal origin and hypertension of some other sort before having any rational occasion for operating.

There is no good evidence of sympathetic control of skeletal muscle. For some years operations were done on the sympathetic system in order to diminish the tone of skeletal muscle. That was done on the assumption that the sympathetic had an important effect in maintenance of muscular tones. Royal, whose name is associated with that interest, came to the laboratory and I presented him with an animal with the lower abdominal sympathetic removed on one side, and I said, "You test the knee jerks and tell me on which side the sympathetic has been removed," and he made the test and told me that he couldn't tell.

There's no better test than that, it seems to me, to show whether there is or is not a sympathetic control of muscular tone, and the test when put up to the person who has made the claim had such results that he couldn't tell the difference.

Then there is a further matter that ought to be perhaps considered in connection with a somewhat thoughtless removal of control of the adrenal glands. The adrenal glands are very important agents for liberation of sugar from the liver. We recently got evidence that it's only by the circulating adrenalin or by the substance given off from the liver or blood vessels, sympathin, that sugar is liberated from the liver. And if normal animals with a normal innervation of the adrenals are given insulin, this is usually per kilo, you observe that the convulsions from hypoglycemia occurred in only one instance and then after three and a half hours of endurance of the hypoglycemic condition which might result from the insulin injections. In animals with the adrenals inactivated, that is with the sympathetic supply severed on one side and the adrenal removed on the other, similar

doses of insulin, smaller in most instances, brought on convulsions in all but three instances and these convulsions occurred in the neighborhood of about an hour and a half after the insulin was injected.

Those are the main points which I would call to your attention from experimental observations on animals deprived of the sympathetic system and now I suppose the meeting is to be turned over to someone else.

DR. MANN: I should like to call on Dr. S. Marx White for discussion of the medical aspects of the problem.

DR. WHITE: To me Dr. Cannon's presentation is as those he has so many times made before, of extreme—not only importance, fundamentally—but interest. The clinician, of course, has no right to discuss the experimental side of this unless he makes himself an experimental physiologist, and yet the clinician must be something that many of us were, in my student days at least, a pseudo-physiologist. He must at least listen with a great deal of care to what the physiologist has to tell him.

Dr. Cannon's application of his study to the problem of hypertension, for instance, brings into the discussion one of the fields in which very active interest is manifested today, on the part of the physician and of the surgeon. Those of you who are interested in the development of our knowledge of hypertension, may recall a very interesting discussion which Volhard gave as long ago as ten years in discussing the different types of hypertension. And to me it is of extraordinary interest to see that the physiologist has brought out now by experimental work that Volhard had previously emphasized from inductive reasoning. Volhard, if you will remember, divided roughly, for the purposes of clinical discussion, hypertension into two groups which he divided into the red and the white hypertension.

Now I remind ourselves of that because to my mind it has a very interesting bearing on the problem that we are concerned with in medicine today, one of the problems of the possibility of effective surgical approach upon essential hypertension. If all this is true, and the application in animals and its analogies in man seem to make it so, then the usual surgical

attack on the malignant type of hypertension would seem to be directed at the wrong point; because there are many facts which make it probable that the malignant hypertension is a type in which a humoral mechanism has come into play, the arteries of the kidney having been involved up to the point where some substance, possibly elaborated in the kidney, possibly related to what some writers have called rennin, and what not—a humoral substance is elaborated. Dr. Cannon brings out the combinations that can be brought about by surgical operation. I remember having heard a few months ago of the experiments to which he has alluded by Anley and Herring; both produced a hypertension by ablation of the connections of the carotid sinus. They then caused a disappearance of this hypertension by removal, complete removal, of the sympathetic nervous mechanism and then followed this by the use of Goldblatt clamps and again produced hypertension; the conclusions of these writers, on the basis of accuracy of these experiments were that this form of hypertension at least, was humoral in origin. The kidneys possibly are the source.

If all this is true, and there is much to make us believe that it is so, then if we are to indulge in an attack on the problem of hypertension from the surgical standpoint, it drives us back to the surgery of the benign, so-called essential, benign hypertension. Many of us physicians believe that such an attack as that is probably unnecessary but it may be that we'll come to just such an attack as that; but for the present it seems to me that our attack is probably along the line of teaching these individuals the proper adaptation to their environment from the affective, so-called emotional, side.

Now if I have a minute, there is one other reference that I would like to make, and that is to a part of the autonomic mechanism to which Dr. Cannon has not addressed himself—and that is to the carotid sinus as a pit of this autonomic mechanism. The knowledge that has been acquired of the means, the modes, by which the carotid sinus can be stimulated has added very greatly to our means of diagnosis in heart diseases. The recognition of certain types of syncope in which there may be slowing even to asystole on the part of the ventricles, dropping blood pressure or some form of cere-

bral reflex which causes syncope, and our knowledge along this line, too, enables us to recognize these cases. We can by stimulation of the carotid sinus, under the finger, reproduce the symptoms and in certain cases where the malady is severe enough, the carotid sinus can be disconnected. But also our knowledge of the effects of the carotid sinus as a part of this regulatory mechanism aids us very greatly in that we can in many instances abate tachycardia and can help often in the diagnosis in the type of mechanism that is occurring not only with but without electro-cardiographic recording. I am just mentioning these very few brief points concerning the knowledge of the autonomic mechanism so marvelously brought out by the physiologists in recent years which aid us in medicine.

DR. MANN: Professor Visscher will now discuss some of the less appreciated results of activities of the vegetative nervous system.

DR. VISSCHER: When Dr. Mann first asked me whether I would contribute to this round table discussion I hesitated a number of days because I felt it would be presumptuous on my part to suggest that I could really contribute anything worthwhile. On considering the question a little further, it occurred to me that there were some points in which the autonomic nervous system had come into some of our observations on aspects of physiology that would not seem to be immediately connected with that subject; and I have rather surmised that those who are experts in the field of autonomic nerve physiology would probably slip over, or at least not be as concerned with these mechanisms, as some of us who look upon the autonomic nervous system as something less than our major interest. It occurred to me on considering the things I've been interested in the last few years, in which some autonomic nerve effects have come into the picture, that I might profitably refer to one or two of them. In view of the time, I shall refer to only one.

In studying the process of absorption from the small intestine, we've been interested in the ability of the intestine to move substances against concentration gradients, placing solutions of mixtures of sodium sulphate and sodium chloride, in isotonic solution in the gut. Over the period of a very few minutes, fifteen

to thirty in the waking dog with surgically prepared loops, the sodium chloride concentration in these loops will fall to very low values—perhaps one per cent or just a few per cent of the blood levels for these constituents. Dr. Dennis made the very interesting observation, it seems to me, that a few dogs on whom these surgically prepared loops were made just simply did not show absorption from the intestine when they were made to lie on the table, quietly, without being tied down, and that, instead, the volume of fluid in the loops of intestine, these surgically prepared loops, increased. Well, now to make a very long story short, we anesthetized these dogs and found under anesthesia their intestinal loops absorbed fluid just as well as other dogs. And it came out that these were dogs that were very excitable. On inspection of the mucosa of the exposed loops we found that when they were placed on the observation tables the mucosa was blanched and white and obviously there was diminished or perhaps very little blood flow. It was an emotional reaction probably mediated by autonomic nerves, and if we had more time I should like to ask Professor Cannon some questions on this point but I shall not do so because there are two people who must have some time on this round table program.

I would like to make this observation, however, which comes out of my thinking in connection with talking to this group—that there are undoubtedly very many physiological reactions in the carrying out of which we cannot afford to ignore the importance of the autonomic nervous system in the real life situation. When one sees in such a simple matter as the absorption of water and salt from the intestine, the effect of the sympathetic nerve stimulation, which was undoubtedly the mechanism in this case, it cannot be doubted that more complicated processes that are going on in the alimentary tract are likewise involved. We know they're involved, of course, and this happens to be simply a very striking demonstration of that involvement.

DR. MANN: Some of the more recent clinical work on the subject will be discussed by Dr. B. T. Horton.

DR. HORTON: Dr. Mann, Dr. Cannon, ladies and gentlemen, As I listened to Dr. Cannon's

presentation, I could not help but think of a saying which I learned in high school that comes from Shakespeare, many of you will remember it, when I quote it: "There are more things in heaven and earth, Horatio, than is dreamt in our philosophy." And I have a feeling that there are more signs and symptoms in clinical medicine and surgery produced by the autonomic nervous system than have yet been recorded in our textbooks and in our medical journals. I could not help but wonder as Dr. Cannon showed the picture of his cats without a sympathetic nervous system what the human individual would do or how he would behave if the sympathetic nervous system were removed. Certainly I think from a standpoint of Raynaud's disease that that disease would cease to exist.

Not long ago I saw a patient who developed Raynaud's disease in this particular climate, some twenty-odd years ago. She moved to the Canal Zone and lived there for twenty-odd years and the Raynaud's disease ceased to exist; she came back to this country, to this section, not many months ago; the Raynaud's disease reappeared and she came into the clinic and Dr. Adson operated on her, and relieved that condition.

From the standpoint of our other peripheral vascular diseases, particularly thrombo-angiitis obliterans, it's quite obvious that patients would be much better off, and we would have fewer amputations, if the sympathetic innervation to the involved extremities, was completely interrupted. And as a matter of fact our statistics show, and of this Dr. Adson is well aware, that after sympathectomy for thrombo-angiitis obliterans our percentage of amputations is considerably less than that of the unoperated cases. There are many other phases of this subject which I would like to discuss but time does not permit.

DR. MANN: We have a few more minutes left before it is necessary to go to the other meeting. Who will very quickly keep on with this discussion, so that we will have no delay and these precious minutes will not be lost? If no one responds I am going to call on someone to continue the discussion. All right, Dr. Best, have you anything to say on the subject?

DR. C. H. BEST: I wouldn't like to let you down but I really haven't anything to say except

that I was very much interested in Professor Cannon's remarks. It seems that almost every laboratory in the country is taking keen interest in hypertension. One shouldn't always refer to things going on in one's own laboratory but a portion of it comes to mind. Two of my colleagues have worked out a very convincing demonstration of the fact that some humoral substance does appear in these hypertensive animals, the Goldblatt hypertension, which can be transmitted to normal animals. Some evidence of this was, of course, brought forward by Housay and his collaborators and also by others. But by means of what we've called exchange transfusions, by a pump which will interchange at the rate of 20 or 30 liters an hour blood from one animal to the other, and yet not interfere with the blood volume of either, it's possible to show that this substance can be transferred from a hypertensive animal to a normal one and a very significant rise of pressure occurs in the unoperated animal. Instead of using the Goldblatt clamps, which of course are very efficient, it's equally satisfactory just to take out one kidney and put a plaster of Paris cast on the other, to prevent the compensatory hypertrophy, and tremendous hypertension, of course, develops very rapidly. Then when these dogs are joined, it's really just a transfusion of equal volumes both ways, the hypertensive effect becomes immediately apparent in the recipient.

DR. MANN: The surgical phase of our subject will be discussed by Dr. A. W. Adson.

DR. ADSON: I think we're very fortunate in having Dr. Cannon here today to give us his summary of his physiological experimentation on the autonomic nervous system, because it is apparent that there are a number of diseases that result from abnormal conditions of the sympathetic nervous system. And as a clinician and surgeon I've been very much interested in this problem for a number of years. All of you are familiar with the fact that Leriche suggested that by periarterial sympathectomy you might alter the vasomotor tone of the peripheral arteries. But as Dr. Cannon told you in his address, it is apparent that the nerve supply follows the artery for but a short distance, and that new fibers enter the sheath of the artery at corresponding levels, and this fact has led

to some of the more or less radical sympathectomies with the hope perhaps that we may alter the spasticity that does exist and is responsible for such diseases as Raynaud's and other allied peripheral vascular diseases where vasospasm plays a role.

Shortly after Royle advocated ramus section, I attempted to reproduce the same result in the hope of relieving spastic conditions. Instead we learned that an extensive lumbar sympathectomy, removing the trunks and dividing the rami, produced a vasomotor change apparently permanent; we then applied it to Raynaud's disease. This was done first in 1925, and that same person today is completely relieved of a Raynaud's disease affecting toes and feet and in the lower part of the legs. But when we began to attempt to treat the conditions of the hands, we met with some difficulty and some disappointments. Apparently the distribution to the arteries of the hands and fingers is somewhat more complicated than is the distribution of the lumbar group which supplies ultimately the vessels of the toes and feet.

At the present time, there's some argument as to whether or not we should divide the pre-ganglionic rather than post-ganglionic fibers. I think I can state very definitely because we've had quite an extensive experience, and speak this fact—that from our own experience, it would appear that the thoroughness of the operation plays a much larger role than the mere question of pre- or post-ganglionic section. At the present time there are some operations that have been advocated which consist of dividing the trunk of the thoracic chain below the third thoracic sympathetic ganglion with an avulsion or division of the rami to the second and first. We have tried this operation and find that we have not obliterated all of the vasospasms. Therefore, in reviewing our own cases, it is ap-

parent that if we can carry out a thorough interruption of all of the vasomotor fibers whether they're pre- or post-ganglionic to the hands, a permanent vasodilatation takes place, and we have many patients who have been very carefully studied before and after operation, years afterward, to substantiate this statement. So that this work in which Dr. Cannon has been a pioneer I am sure will contribute more and more as time goes on in the control of these various diseases.

Time does not suffice to take up a discussion of hypertension in which I've been very much interested and shall discuss tomorrow, except to say that my first stimulus came from the fact that when a spinal anesthetic was given to a patient for some abdominal or perineal operation, a drop in blood pressure always developed. And in the early history of spinal anesthesia this drop in pressure was a serious situation. As I watched these hypotensions, it occurred to me that if it would be possible to rob a vascular bed of sufficient size, of its central influence we might create a reservoir and reproduce the same changes that took place when you administered a spinal anesthetic. And naturally our first method was to do a laminectomy and divide the anterior roots from the sixth dorsal to the second lumbar inclusive on both sides.

That operation is a rather heroic procedure and has been altered. I shall be pleased to review tomorrow our experiences, our successes, our failures; but I want to emphasize one point whether you are attempting to treat Raynaud's disease or peripheral vascular disease or hypertension, the only ones that you can hope to alter are those patients who present a vasospastic phenomenon. And above all, select patients in whom there is some likelihood of securing the results you desire to accomplish.

CLINICAL PHYSIOLOGY OF THE GASTRO-INTESTINAL TRACT

Chairman: DR. OWEN H. WANGENSTEEN

Professor of Surgery

University of Minnesota

Leader: DR. ANTON J. CARLSON

Professor of Physiology

University of Chicago

DR. WANGENSTEEN: We are celebrating now the Fiftieth Anniversary of the establishment of this medical school. In that original group of teachers at this school the only full-time preceptor was the professor of chemistry, who in all likelihood was an adjunct from the department of chemistry. Whereas throughout the country, schools boasted men who professed an interest in physiology, there were very few departments of physiology. At the invitation of President Eliot of Harvard, Bowditch organized the first department of physiology in a medical school in this country in 1871.

In the last two decades there has been a general pyramiding of interest in functional studies. Yet, today, physiology in the ordinary curriculum does not have assigned it the number of hours which the importance of the field justifies. The apparent lack of interest on the part of the clinician in clinical physiology has probably been due in no small part to his inadequate orientation obtained in the subject while an undergraduate medical student. However, the interest of the clinician in physiology is being augmented daily by observations in the wards which show the great importance of physiology for the practice of medicine. Those who concern themselves with disturbances of the alimentary canal have the opportunity to observe daily the necessity of employing physiologic approaches to the solution of gastro-intestinal problems.

On the part of physiologists who term themselves general physiologists there have been many who have given the alimentary canal and its appendages their best thought. The leader of this discussion is, amongst that group, one of the keenest exponents of the physiology of the intestinal canal. It was in this Northwest Territory that William Beaumont, now somewhat more than a century ago, made one of the most important and original contributions to the understanding of digestion that has ever been made. Our speaker too has had his Alexis St. Martin and, together with his pupils, has contributed a great deal to a better understanding of the physiology of gastric secretion.

DR. ANTON J. CARLSON is at present Professor of Physiology and Chairman of that Department at the University of Chicago. Doctor Carlson was born in Sweden and came to America at the age of sixteen. He had his early training at Augustana College and after an interval began his scientific studies at Stanford University in California where he earned the Doctor of Philosophy degree. Aside from a brief interval in 1904 when he was engaged in research at the Carnegie Institute he has spent his whole scientific life at the University of Chicago, where he has had a profound influence on educational and research policies and where he has carried on his scientific work.

Doctor Carlson's studies have dealt mainly with the physiology of the digestive system and of the endocrine glands. He has studied the physiology of hunger and appetite and provided much important information about such disease states as gastric ulcer. He has had a great influence on American physiology through many students who have been trained under him and who now hold important positions in other American universities and research institutions. His students hold professorships in about twenty other American universities.

There are many clinical problems in the gastro-intestinal canal that will be more readily understood when gaps in our knowledge of the normal function of the alimentary canal are less numerous. What specific theme Dr. Carlson has chosen for this discussion, I do not know. The title affords him unusual latitude. Clinicians interested in gastro-intestinal disorders are happy that general physiologists of the stamp of Dr. Carlson interest themselves in these problems. Confronted with the enigmas of etiology and the baffling problems of therapeutics presented by such conditions as ulcer, appendicitis, constipation, bowel obstruction, and deficiency diseases having their origin in malfunctioning of the digestive tract, like the Apostle Paul, the clinicians cry out to the physiologists, "Come over into Macedonia and help us." It affords me great pleasure to present to you Dr. A. J. Carlson, Professor of Physiology at the University of Chicago, whom all of you know. Dr. Carlson will take over the reins of the discussion.

DR. CARLSON: The clinical physiology of the gastro-intestinal tract obviously can not be discussed adequately in an hour's time. The cardia, the pylorus, the stomach, intestinal peristalsis

and paralytic ileus, and the large bowel alone—any one of these could not be exhausted in such a discussion.

The logical man to open this discussion is Dr. Cannon of Harvard who did the earliest significant work on the gut with the x-ray. Dr. Cannon also was the first to establish the motility of the empty stomach in connection with hunger. I first became specially interested in the alimentary tract years ago partly because I had an "Alexis St. Martin," and some of the work on motility and secretion of the stomach in normal man was followed out, of course, on animals.

For the last five or six years my students and I have been interested in problems of the large bowel, so far confining these studies to the dog. In beginning this discussion I just don't know where to start. It remains to be seen if I know when to stop. The best way would be for the clinicians to take charge of the discussion entirely, while I listened. Perhaps my experience might throw some light on the difficult scene. Many of these problems are still in the "No Man's Land."

Take the motility problem alone. We have now pretty well explored the action of the efferent extrinsic nerves of the gastro-intestinal tract. We have two types of nerve action: one producing increased motility or increased tone, the other producing inhibition, by direct action or by liberation of choline or of sympathin. This seems very uniform in man and the animals. But in the experimental animal the effect of loss of action of these nerves produces but slight and temporary effects. Section of the nerves may produce a temporary disturbance in motility of the stomach, but it is astonishing how quickly the stomach, pylorus, large and small intestine adjust themselves and carry on the work very well. One puzzle to me in regard to the large bowel is this: the removal of all extrinsic nervous control of the gut in animals like the dog produces far less disturbance of the large bowel than section or crushing of the spinal cord in the thoracic or lumbar region in man. Important as is the study of these nervous relationships to motility of the large intestine in the dog, cat, rabbit, rat, we shall undoubtedly find species variation in the capacity of adjustment. Those of you who are bald-headed and gray will recall the old days of

gastro-enterology when our main problem was "dyspepsia" and the universal remedy was pepsin and hydrochloric acid. "Dyspepsia" has disappeared, I hope, even from the prairies of Minnesota and I don't know how many tons of pepsin and hydrochloric acid were administered while this theory was green. I can see very well how hydrochloric acid can be useful under certain circumstances but the astonishing thing to me has been the ability of the human gut to adjust itself with little or no gastric digestion going on, as is well known in the chronic case of achlorhydria, apparently from early childhood, if not from birth, and with fair intestinal digestion still taking place.

Then came the period of "autointoxication," the period of Metchnikof. I don't know what you think of autointoxication as the universal cause of human ills, but I am quite certain it is overdrawn. I can give you an instance in my own experience, discovered by accident. In the early days when yeast was supposed to be the "cure" of many gastro-intestinal ills, I was asked to make a study on the effects of yeast on alimentary function in man. I did it on some hundred medical students, men and women. One medical student, an ex Texas cowboy, proved to have on the average, one to one and a half bowel movements per week. He was a boy between twenty-three and twenty-four. When I saw his record I thought he must be either dying or half dead. He really did have only one and a half bowel movements per week but he was perfectly healthy, with no evidence of autointoxication. I am perfectly certain that if the other students had done something to suddenly delay their large bowel evacuation for four or five days they would have had all kinds of trouble, headache and malaise. If changes come on gradually, apparently there are capacities for adjustment to distension without disturbance and possibly even capacities for diminished absorption of toxic substance.

Now, so far as the extrinsic gastro-intestinal nerves are concerned, the local motor and secretory tissues carry on without them through chemical factors. It doesn't mean at all that when these nerves are present and active they cannot under certain conditions produce serious motor and secretory disturbances. In other words, the fact that the gut can carry on without the extrinsic nerves doesn't mean that these

nerves can be forgotten when the doctor is confronted by his patient.

A great many chemical factors have been assigned the role of motor control of the gut, particularly acetylcholine. I haven't yet seen any experiments that are conclusive enough to demonstrate to me that we have yet put our finger on a specific motor hormone of the gut as a whole. But we have a specific hormone aiding in the motor control of the gallbladder, and the depression of gastric motility by fats appears to be due to a hormone developed by the gastro-intestinal mucosa when acted on by these fats.

We have become rather interested in the cause of the partial to complete suppression of the gut motility in peritonitis. There are apparently reflex mechanisms, from the peritoneum through the central nervous system, to explain this paralysis of the gut on reflex grounds. I am inclined to think that, even with all the extrinsic gut nerves eliminated and central reflexes gone, motor paralysis of the gut by direct action or toxic bacterial products or acting by local reflexes in the gut, may still occur. Certainly bacterial toxins intravenously administered in the dog will cause total paralysis of the motility of the colon at least for twenty-four hours but we have not yet totally denervated the whole length of the gut.

I don't think the problems of secretion of bile, pancreatic juice or of gastric juice are of primary clinical significance except, possibly, with ulcers. It is remarkable, if other factors are right, how much one can suppress pancreatic secretions and gastric secretions without causing symptoms (at least in the experimental animal).

In the early years I was interested in the sensitivity of the gut in connection with the problems of pain, hunger, and thirst. There is no doubt that dull pain or even acute pain can be produced through naked nerve endings in the wall of the gut. These pain nerves may be activated either by muscular spasm or by distention, as by gas or fluid, yet one can have spasms without producing conscious pain both of the cardia and the pylorus. I haven't seen any evidence that the pyloric spasm of infants, sometimes called hypertrophic pyloric stenosis, is especially painful.

However, there is a still bigger problem on

which I have not seen any way of getting on. The reason is that you can't do very much with it on the experimental animal. It is this: the change in the efferent stream of impulses from the gut that leads to the depression which we see where there is disturbance of the normal gastro-intestinal mucosa plus possibly some disturbance of motility. That disturbance of the general state of consciousness seems to me out of all proportion frequently to the extent of the mucosal lesions or degree of the disturbance of motility that we find. This is one of the large terra incognita in the pathological physiology of the gut.

I am afraid I don't take my own medicine. I really should have sat down and let the clinicians question me. I may have gathered some insight through years of labor. At least I have learned to observe my own gut. I think that early observations of Cannon on the cat still apply to dog and man. I know it applies to me. I was in the midst of the study on motility of the empty stomach in man, and attempted to demonstrate some of the new findings to members of the Physiological Congress in Holland. To be sure that my stomach was empty I begged off from dinner with Professor Hamburger the evening before. I knew we were not only to be dined but wined as well and I didn't know what condition my gut would be in the next morning. My stomach was empty and I thought everything was all right and when I got the balloon in, with physiologists standing around, all I demonstrated was a perfectly flat line on the kymograph with complete gastric inhibition. Pavlov remarked: "This is also a physiological demonstration," which was perfectly true.

Dr. Wangensteen, when a physiologist follows the rabbit and a gastro-enterologist follows the rabbit they invariably meet because the machinery in health also figures in disease. I have lately been concerned with a chapter in a projected book. The chapter is on the criteria of normalcy. Normalcy is not a line but it is a broad band and it is in that broad band where the physiologist and the gastro-enterologist who does something else than worship the follies of the best, will invariably meet.

DR. WANGENSTEEN: Dr. Walter Alvarez has been particularly interested in the influence of the autonomic nervous system upon the digestive tract. Dr. Carlson's remarks, I am cer-

tain, have stirred up in Dr. Alvarez some interesting experiences that he would like to comment upon now.

DR. ALVAREZ: As clinicians we are interested in the colon when it doesn't do its work, or when it does it too thoroughly and too vigorously. So often we hear that constipation should be divided into two great groups, those in which the colon is either atonic and those in which it is hyperactive and spastic. My feeling is that the colon would always be strong enough to do its work if the nervous system would only leave it alone. Many of you here must have had experiences which showed you that constipation is primarily a nervous disease. For instance, I know a woman whose bowels moved regularly twice a day until years ago she contracted an unhappy marriage. She immediately became severely constipated and started going from one physician to another. After many years of this she fell in love with another man, and with the coming of happiness she lost her constipation and the resultant indigestion and headache.

An old physician once told me about a rancher's wife who came a long distance over mountain roads to consult him in regard to severe constipation. Because static electricity was popular in that day, the doctor put an electrode into the woman's rectum and gave her twenty minutes of sparks. She wrote later that she was entirely cured and very happy. A few years later when she returned for another treatment, the doctor had lost interest in static electricity and his friction machine was not running. The woman, however, wouldn't be put off. The doctor tried his wall plate, but that too was dead. Then he found the metronome would still run so he connected her up and gave her twenty minutes of "tic tocks." To his astonishment she reported later that this had cured her, and then he knew that she had a psychic type of constipation.

I know that in my own case a bowel which is as regular as a clock when I am on a vacation can become constipated when I am under strain and fatigue from overwork. I can remember times when I became constipated suddenly because of worry over the illness of one of my children.

We all know that in many persons the colon

is very sensitive to emotion. We have all seen patients who developed diarrhea when anxious or worried or frightened. Many of the diarrheas which I see are due at least partly to a congenital tendency to the emptying of the colon under excitement. This tendency is very marked in the apes and the monkeys. Whenever a physician cannot find a physical cause for diarrhea he should make certain that the patient isn't worrying over a lawsuit or an impending divorce.

One of my patients one day said, so wisely, "Doctor, if I could only be worried to the right degree my bowels would be perfect. If I worry a little they get constipated, and if I worry much they get loose." I have known many persons who have diarrhea all day when they are going to take a train in the evening. I have known many girls who couldn't go out with a beau without getting diarrhea or being much frightened for fear that they would get it.

You clinicians know that one of your greatest problems is that of the woman with a sensitive colon. I beg of you not to tell her that she has colitis simply because her roentgenograms show a spastically contracted descending colon with perhaps a little crinkliness on the edges due to spasm. There are two reasons why we shouldn't tell these people that they have colitis. One is that we all know they haven't a true colitis. If one opens the abdomen one finds a perfectly normal looking colon, and if one looks through a tube into the sigmoid loop one sees a normal mucosa. Furthermore, these people, even if they live into their eighties, never come to any bad end because of their sensitive colon and their excessive secretion of mucus.

The other tremendous objection to telling these women that they have colitis is that the victim will promptly ask her friends if anyone knows anything about colitis, and then if someone speaks up and says, "Why yes, my brother had chronic ulcerative colitis and he was dead in six months," the patient becomes scared to death, and then no amount of reassurance may ever straighten her out again.

I tell these patients that they have a highly sensitive colon which they inherited from their ancestors. They will have it all their days and they must learn to live with it. It will become

less sensitive as they grow older. I tell them it would be a perfectly good colon if only their nerves could leave it alone.

Today we realize that when autonomic nerves are stimulated, chemical substances, which have powerful effects on smooth muscle and glands, come out of the endings. Interestingly, when Dr. Chester Jones and one of his associates took some normal students and injected them with acetylcholine, the substance which is formed at parasympathetic nerve endings, he could see through a sigmoidoscope that the mucous membrane changed in appearance, and mucus and fluid came out of it. Interestingly also, one day when Dr. Jones called an artist to make a water color drawing of the appearance of the mucosa, the student happened to glance up, and when he saw a pretty girl looking into his rectum, he blushed violently all over the inside of his bowel!

I have long felt almost certain that such changes in the circulation of the bowel must take place under emotion, and they must account for some of the sudden attacks of flatulence and bloating which are suffered by nervous people. Years ago Sinelnikoff transplanted a segment of jejunum under the skin of the thorax, preparatory to making an artificial esophagus for a patient. He could see then that under the influence of emotion the mucosa changed from a dull pink to red. Similar changes were observed by Beaumont when he looked into the stomach of Alexis St. Martin.

Years ago the question occurred to me, Why is it that the colon is so much more reactive to emotion than is the rest of the digestive tract? Then as I thought a little more, I said to myself, "No, the esophagus at the other end is perhaps even more responsive to emotion." The other night I sat in the theater alongside of a man who suddenly, when the hero of the play got into an extremely dangerous and unpleasant situation, began to belch repeatedly and apparently painfully. He obviously was almost strangled by the waves which, because of his excitement, began to run back up his esophagus. How many of us physicians there are who have "the burps" and heartburn all afternoon simply because we took guests to the club for luncheon. We wouldn't have had any distress if we had eaten quietly by ourselves at home.

It seems to me that the reason why the two

ends of the digestive tract are so reactive to emotion and nervous strain is that they are most influenced by the spread of impulses from the somatic nerves, which come close to the autonomic ones at the orifices of the body. Clinically, then, whenever we see a woman with a tale of woe about a sensitive colon that hurts and burns and won't empty itself right, let us first have great sympathy for her because her distress is very real. I know it is real, because my mother bequeathed me such a colon, and occasionally under heavy psychic strain I have suffered the same type of constant torture that these patients so often describe. When a woman tells you that she takes two or three enemas a day to try to get relief from a constant burning and consciousness of her rectum, don't sneer at her and don't get angry at her. I assure you that if you had the same distress you would soon be nearly frantic, and if you could get relief from frequent enemas, you would take them.

I beg of you also that when such a woman comes you do not tell her immediately that she has a redundant colon or a spastic colon or a long sigmoid loop or some other common and harmless anatomic variant that she can worry herself sick about. Usually I have to x-ray the colon of such a woman once or twice simply to help get rid of a fear which, with the best of intentions, someone implanted in her mind. Often she says, "But Dr. So-and-So told me that I had a long sigmoid loop. What are we going to do about it?" And then sometimes I remind her that my cook is four feet ten and my son-in-law is six feet five. Are they diseased? No, neither of them is diseased; they are both very healthy, normal persons. They simply represent varieties of the human species. Similarly, the woman's colonic peculiarity does not represent disease and is not responsible for her many aches and pains or even for her constipation. As you know, colons come in all shapes and sizes, and you can find all these shapes and sizes in the big husky members of your football squad here at college.

Furthermore, I would suggest that you not try to treat a sensitive colon with medicated enemas and diets and attempts to change the bacterial flora. The best results that I have ever seen have been obtained by finding out what sort of strain the woman is under. Find out why she is

unhappy and worried, and then try to help her to live more sensibly, to get more rest, and to live with her sensitive bowel. Many of these women can be greatly helped in this way. Occasionally, when the colon is burning and "raising Cain" a quarter of a grain of codein will bring peace and comfort. I don't think it is dangerous to prescribe this drug for sensible persons who will use it only occasionally. In thirty years I have never seen a habit produced by codein. I don't like the present day common practice of filling these poor people with phenobarbital. Sometimes it helps a great deal, but then it should be used intermittently and only on "bad days."

DR. WANGENSTEEN: Method is as important as an idea in the solution of a problem. There are many who have had an excellent idea who have failed in their objective because of want of a proper approach or technic with which to attack their problem. When a man with good, original ideas possesses as well, mastery of technical methods, worthwhile contributions follow as a matter of course. Dr. George H. Whipple, who is in the audience, made an abiding contribution to the knowledge of intestinal obstruction when he devised the "closed-loop" method of studying the effects of obstruction. I am wondering whether Dr. Whipple will not, on this occasion, say something of his first scientific love—intestinal obstruction.

DR. WHIPPLE: I came here today to listen and have enjoyed the discussion very much, and particularly this opportunity of chatting with my old friend, Dr. Alvarez. It is so long since I worked with the subject of bowel obstruction that I should prefer to remain one of the audience.

DR. CARLSON: I, of course, followed Whipple's pioneering work and some work was done in my laboratory upon the machinery inducing the symptoms of bowel obstruction. The problem is not completely solved yet, but I ought to add a little to what Dr. Alvarez said. There is no doubt that those conditions he described are in the main correct. I can verify some of them on my own person. But here is the puzzle that there are any number of people, men and women, who are under equal or greater strain and they don't show gut disturbances. Where is the differential?

DR. ALVAREZ: May I mention you said once that you hoped that day might come when you could cut your systemic nerves and go about your work in peace and quiet?

DR. CARLSON: The trouble is I delayed too long; now we know perfectly well we would have to cut the whole mess.

DR. WANGENSTEEN: As most of you know, Dr. Edward A. Boyden of the department of anatomy in this school has been very much interested in the mode of origin and transmission of painful stimuli having their origin in the intestine. Dr. Carlson's discussion of visceral pain has undoubtedly brought to Dr. Boyden's mind some things upon which he would like to comment.

DR. BOYDEN: Visceral pain is a large subject and one that I would not venture to discuss in this short time. But while listening to Dr. Carlson and Dr. Alvarez I have been impressed by the attention given to the action of extrinsic nerves upon the colon. I should like to ask Dr. Carlson to discuss the reverse effects—what is known about the action of nerves from the colon upon the rest of the body, as, for example, the effect of distention of the colon upon the secretion of bile. Perhaps, also, he would tell us something about the hormones secreted by the large intestine?

DR. CARLSON: There is no difficulty of showing, of course, that distention of the colon through stimulation of sensory nerves in the colon will induce many kinds of reflexes. So far, we have done it only on experimental animals. I did some of it years ago when I started this work on visceral sensibility. But in any individual human patient, it is going to be difficult to say whether the gas, distention, or spasm is the cause of pain that leads to disturbance in the body. Of course, these are "hormone days" and I have, I think, unfortunately assumed some, or labeled some in connection with the gut, prematurely, in past years. I don't know whether we have real hormones from the large bowel or not; it is going to be very difficult to prove or disprove it, in my judgment. Certainly by the exclusion method, by the removal of the entire large bowel, no defects are produced that have so far been detected, mainly because it is just

one factory of the hormones and some are produced somewhere else. In other words, the method of extirpation, which works in the case of parathyroids, anterior pituitary, etc., is of little value here. Concerning hormones which govern gut motility in health and in disease, it seems to me that on that subject we are where we were forty years ago when we started to study the effects of intravenous injection of crude tissue extracts on the blood pressure. This was before the discovery of adrenalin and of pituitrin. Many actions may be induced by parenteral administration of crude extracts, in acute experiments. But it is another story to prove that the substances responsible for such actions in acute and crude experiments are also produced in the body as part of the machinery of health and of disease. Have I been sufficiently vague, Dr. Boyden? In that case, come again.

DR. LEO G. RIGLER: For many years we have heard roentgenologists discuss the observations of Forssell anent the independent movements of the mucous membrane of the digestive tract, but physiologists appear to have given his theories scant attention. Forssell believes that the mucous membrane of the stomach moves freely and without reference to the remaining segments of the gastric wall. Furthermore, he believes this results in the formation of small, independent digestion chambers. I should like to hear Dr. Carlson's comments on the validity and importance of these theories.

DR. CARLSON: I am quite familiar with the apparently independent motility of the intestinal villi, following the work of my pupil, Dr. King, now at Vanderbilt. In some species these villi are not present in the intestinal mucosa. When present, they seem to move quite independently of the neuromuscular machinery of peristalsis. Certainly the villi are absent from the stomach. Mucosal motility in the stomach must be governed by the muscularis mucosa, because there is no other machinery. There is nothing to suggest the gastric mucosa has ameboid power. But anybody who has studied the swaying and pumping action of the intestinal villi will realize that where present the villi are a physiological mechanism of the first order.

DR. JAMES B. CAREY: The explanation of gastric pain with respect to the lesion involved

has always interested me, particularly since I have been doing gastroscopic work. It isn't hard for me to explain, very crudely perhaps, the occurrence of gastric pain, given a deep indurated ulcer involving all of the layers of the stomach; but when I visualize with the gastroscope what seem to be insignificant punctate submucous erosions or a condition of atrophy of the mucosa or single submucosal hemorrhages, it is difficult to reconcile the complaint with the lesion. Some of these people complain quite bitterly of pain, comparable to that of an ulcer; on the other hand, individuals with objectively extensive lesions have no pain at all.

Dr. Schindler has mentioned numerous times that he has noted the occurrence of pain of severity equal to that of ulcer, the only explanation he could find being one or more submucosal hemorrhages in the stomach. I can't imagine such a condition enduring more than a few days. On the other hand, one of the most extensive hemorrhagic ulcerative gastritis patients that I ever saw (probably secondary to a cirrhosis of the liver), involving the upper third of the stomach, observed gastroscopically on three different occasions, each time presenting the same hemorrhagic eroded condition, was accompanied by no symptoms referable to the stomach at all.

Certainly the relation between the visible changes in the mucosa and submucosa and the symptomatology puzzles me very much. For that reason it has been so very difficult to arrange a symptomatological picture for gastritis.

DR. CARLSON: Well, I don't know either but maybe in the future some of these puzzles which I have been seeing and hearing about during thirty years of attention to the problem will clear up by better experiments and clearer thinking. The great individuality and chameleon-like character of the gut is obvious. Early I ran up against this fact. In some perfectly healthy individuals powerful contractions of the stomach, the hunger contractions, produce no sensations. On the other hand, in other individuals, more or less nervous, the same degree of gastric contractions will call forth agony and cold sweat.

DR. WANGENSTEEN: The hour is growing late, I know, but before we adjourn there is one question I should like to ask Dr. Hal Downey of the department of anatomy in order that we

may have his reaction as well as that of Dr. Carlson.

It is my impression, Dr. Downey, that there are problems in gastro-intestinal functional studies that may be attacked most effectually through a joint approach of microscopic morphologist (histologist) and physiologist. We all know of the corroboration lent the functional studies upon the secretion of isolated gastric pouches (Heidenhain) by the splendid morphologic studies of Bensley. Could not the morphologist, working in intimate collaboration with the physiologist, give us helpful information concerning other physiologic processes?

DR. DOWNEY: I think it would be possible to carry on experiments on the physiology of the digestive tract from different standpoints, that is, coöperative research in the best sense of the word.

Many problems which seem to be primarily of interest to the surgeon, some of which Dr. Wangenstein has been considering recently, depend on the fields of physiology, histology, pathology, and even hematology for their final solution. One can think of many problems in the physiology of the digestive tract which require the coöperation of men working in these different fields.

DR. CARLSON: I agree with Dr. Downey, but the use of the microscope, alone, on the gut has reached a sort of impasse, unless combined with other technics. A budding medical investigator said, forty years ago, that at that time everything that could be discovered by the microscope had been discovered. That is not so, even today. Histologists can surely help, but the days when the clinical pathologists can use the microscope on dead tissue alone, and help us forward, that day, I think, has passed. What does the physician do, who attempts to answer nature's ques-

tions now? He does physiology, even on his patients. What does the anatomist or the pathologist do? The pathologist is working mainly, not on the structure of dead tissue, but on pathological processes, and so in the entire field. What do the pediatricians, the gynecologists do? They are dealing with functions, with processes! That is one of the reasons why I have not lost much sleep over the fact that physiology is not given a greater amount of attention in the medical curriculum. Now, all doctors become physiologists, some good ones, others not so good. With reference to the way we do it at Chicago, we give the students some free time to think or to waste, then if there is a physiologist, like Luckhardt, who really has something to teach these medical students, these students have pretty good noses and they find it, and as a result in Chicago a large per cent of medical students elect advanced work in physiology, sometimes up to 50, 60, or even 70 per cent above the so-called prescribed medical course. I think that is best. When the students have an opportunity to select what they want, they are not driven. Moreover, I think the teacher, under these conditions, is a little more on his or her toes. I don't object at all. Medical education is in some places so regimented that the student has little or no time, for elective work, no time to find himself in the particular field where his love is directed at present, where ultimately his life work is going to be done. I think the answer lies in more freedom for election because, somehow, the kind of men and women that now get into the medical school are mostly far beyond the idea of getting snap courses. They really are after the facts.

DR. WANGENSTEEN: I am certain, Dr. Carlson, that I bespeak the genuine sentiment of this group when I say that we are grateful to you for this very interesting round-table discussion relating to the clinical physiology of the gastro-intestinal canal.

NEUROPHYSIOLOGY*

Chairman: DR. J. CHARNLEY MCKINLEY

**Professor of Nervous and Mental
Diseases
University of Minnesota**

Leaders: DR. DETLEV W. BRONK

**Professor and Director, Institute of
Neurology
University of Pennsylvania**

DR. HERBERT S. GASSER

**Director, Rockefeller Institute for Medical
Research**

Drs. Bronk and Gasser opened the round table with a general discussion of the pedagogical and practical relationships of neurophysiology to general medicine, neurology and psychiatry, covering the following principal points:

The minor position which neurophysiology has held seems unjustified when one considers, for example, the diagnostic importance of pain and a rising temperature in general medicine, both of which are fundamentally neurological mechanisms which still need much clarification. A tendency exists among many of our colleagues to think of neurophysiology as an abstract laboratory science which has not contributed to the solution of practical medical problems in proportion to the effort and expense which are necessary for its prosecution. But the fact is a commonplace that medical science advances so rapidly that the members of the profession must continually labor and strain in order that their concepts may not become obsolete. Pedagogically, therefore, the teaching of basic physiologic mechanisms in neurophysiology provides the student with the knowledge which enables him to adapt with facility to new revisions in clinical neurologic and psychiatric practice.

Advances in the practical field are most likely to arise from the broadening of our base through the elucidation of all available facts such as the functioning of the synapse and the perikaryon. As these points become more understandable they can be applied more and more to nervous system integration and, it is hoped, finally to the total behavior of the individual. It is not too far-fetched, therefore, to think that the study of isolated neural phenomena may provide explanations which can be carried over into the solution of many of the mechanisms not only of organic neurology but also of civilization's most devastating group of illnesses, namely, the mental disorders.

DR. D. W. BRONK is Professor of Biophysics and Director of the Johnson Foundation for Medical Physics at the University of Pennsylvania. In his laboratory the brains and skill of electrical engineers and physicists are put to work to explore the physics of the human machine.

Professor Bronk's rise to leadership in a new type of Medical Research has been rapid (he is only forty-two years old) and his path is of interest. In the early 1920s he was a young scientist doing brilliant studies in the field of astrophysics. He became convinced that the viewpoint and many of the methods of the professional physicist could be applied to biological and medical problems and set himself to learn biology and especially physiology. Studies at Michigan, Swarthmore, Cambridge University and London quickly showed his ability in his new field and in 1929 he was selected to head the project for a biophysical institute in Philadelphia.

DR. HERBERT S. GASSER is at present Director of the Rockefeller Institute for Medical Research in New York City. He is a graduate of the Medical School of Johns Hopkins University and has been Professor of Pharmacology in Washington University in St. Louis, Missouri and Professor of Physiology at Cornell University, School of Medicine, in New York. He served as pharmacologist in the Chemical Warfare Service in 1918. He is a member of the National Academy of Sciences, the American Philosophical Society and numerous other scientific societies in this country and abroad.

Some recent dividends of this general approach are already in evidence; for instance, the use of liver in combined sclerosis, vitamin B₁ in neuritis, and potassium in familial periodic paralysis. The relationships of increased metabolic activity (hyperthyroidism) to nervous hyperexcitability has long been known and the indications for therapy reasonably well outlined.

Discussion

Dr. Starke R. Hathaway asked for an opinion as to the outcome of the problem of inhibition; whether this will be in terms of the general laws of peripheral conduction as we now know them, or whether new discoveries will be needed in the sense of an inhibitory type of neuron discharge or an inhibitory substance.

Drs. Bronk and Gasser both felt that, though

*Reported by the chairman, Dr. J. Charnley McKinley.

opinion should necessarily be rather guarded, the solution will probably be in accord with laws of the nervous system as now being discovered and elaborated, and that new laws or new functional systems need not at present be invoked.

Dr. A. B. Baker raised the point that frequently the neuropathologist can determine no histological alterations in cell groups in the brain which before death gave obvious clinical evidence of being damaged. He wondered if others

felt as he did that the limitations of the microscopic technic were not the determining factor in such paradoxical situations and what suggestions could be reasonably entertained for shedding more light on such a dilemma.

Dr. Bronk said he had also been troubled by that problem. In his opinion, contributions from related fields (chemistry, electrophysics, for example) might ultimately clear up many phases of the problem.

THE MECHANISMS AND MANIFESTATIONS OF THE IMMUNE RESPONSE

Chairman: DR. A. T. HENRICI
Professor of Bacteriology
University of Minnesota

Leader: DR. MICHAEL HEIDELBERGER
Professor of Biochemistry
Columbia University

Dr. Henrici opened the discussion by relating some experiments which indicate that following extreme infections with ringworm fungi in rabbits there can be demonstrated two sorts of hypersensitivity. When polysaccharide is injected, there develops a diffuse redness and desquamation of the skin. When protein is injected, there develops a circumscribed area of purpura, followed by necrosis and ulceration. Dr. Henrici asked Dr. Heidelberg if he had any other evidence regarding specific differences in the reactions of animals to different fractions of microorganisms. Dr. Heidelberg replied that he had isolated two specific polysaccharides from tubercle bacilli, which gave skin reactions in sensitized animals, as well as several other polysaccharides which were inactive. He stated that polysaccharides extracted from tubercle bacilli in earlier experiments had been drastically handled and were probably therefore inactive. One polysaccharide fraction was degraded by treatment with alkali, which splits off magnesium palmitate. The polysaccharide gives in tuberculous patients either an immediate wheal, or an area of redness which begins to develop in six hours and persists for 24 to 48 hours. This polysaccharide was considered to contain a residue protein. All traces of this protein were finally removed by treating the carbohydrate fraction with trypsin, which destroyed the antigenic property of the protein, and then destroying the trypsin by treatment with alkali. After this treatment, the polysaccharide no longer gave late re-

Dr. MICHAEL HEIDELBERGER is associate professor of biochemistry at Columbia University and chemist in charge of the Mount Sinai Hospital Laboratories. He is widely known for his work on the chemistry of bacterial toxins and of immune reactions. His discovery that complex sugars found in bacterial organisms are of specific importance in immune reactions has been of the highest importance and has attracted worldwide attention. Professor Heidelberg holds the Ehrlich medal for his work in immunology.

actions, but only an immediate wheal, or redness beginning 6 to 8 hours after injection and lasting only a few hours. Dr. Cournand found that the immediate wheal reaction was nonspecific, but that the 6 to 8 hour reaction was highly specific.

Dr. W. P. Larson asked Dr. Heidelberg's opinion regarding the relationship between the size of the globulin molecules and the efficiency of immune serum. Dr. Larson pointed out that in rabbit serum the globulin molecules are considerably smaller than in horse serum, and that rabbits produce more potent antipneumonia serum than do horses. Dr. Heidelberg agreed that there was a definite correlation, but stated that he could not explain the greater efficiency of rabbit serum unless on the basis that the small molecules could diffuse more readily into inflamed tissues than could larger molecules, and that weight for weight, rabbit antibody will combine with more pneumococcus polysaccharide than will horse antibody. Dr. Larson suggested that this might be due to the larger surface exhibited by the smaller molecules of the rabbit antibody.

Dr. C. H. Bailey discussed observations concerning an antigen extracted from tubercle bacilli, which was an ester of one of the inositols. Dr. Heidelberger stated he had not worked with lipid soluble fractions of the tubercle bacillus, but had confined his work to the protein and carbohydrate fractions of defatted cells. Dr. Bailey said he was impressed by the simplicity of the inositol molecule, and Dr. Heidelberger replied that this substance is antigenic only in the complement-fixation reaction, and is not concerned in the agglutination or precipitation reactions. Complement fixation is a more sensitive reaction, and antigens composed of small molecules may work in such a sensitive reaction.

Dr. C. P. Fitch asked Dr. Heidelberger if he had worked with human or bovine type tubercle bacilli, and regarding the nature of the medium upon which they had been cultivated. Dr. Heidelberger stated that he had used human, bovine and avian types of tubercle bacilli, and timothy grass bacilli, all grown on Long's synthetic medium. He could not demonstrate any certain difference in the antigenic properties of the proteins in the human and bovine types. There are, however, definite differences between the protein fractions of human and avian type bacilli. He is working with rabbit serums, and with two horse serums. Dr. Fitch stated that avian type tuberculosis occurs in horses, and it might be possible to use serums from infected animals.

Dr. R. V. Ellis asked if it would be possible to read the tuberculin reaction earlier than is now the case if we used Dr. Heidelberger's polysaccharide fraction. Dr. Heidelberger stated that not enough clinical material had as yet been studied, but that it would probably be possible to read the reaction in 6 to 8 hours.

Dr. L. F. Richdorf asked Dr. Heidelberger concerning the relative merits of old tuberculin and the fractions which he is studying. Dr. Heidelberger replied that testing with old tuberculin was quite different from testing with definite fractions. In old tuberculin the antigens are partially degraded, and the polysaccharide in crude tuberculin is much less active than in the purified material. He pointed out that Dr. Seibert had found it possible to sensitize animals with carefully prepared unheated tuberculin, whereas this cannot be done with Koch's old tuberculin.

Dr. H. O. Halvorson discussed the mechanism

by which antibodies are produced, and asked Dr. Heidelberger if the following statement accurately restated what Dr. Heidelberger had said in his morning lecture regarding this mechanism: The antigen affects the enzyme which produces globulin, and leaves its imprint upon this enzyme so that when new globulin is formed, it has impressed upon it a mirror image of the hapten groups of the antigen. Dr. Heidelberger stated that this was essentially correct, except that Dr. Halvorson had stressed the enzymes more than Dr. Heidelberger was willing to, and that the term "mirror image" was perhaps too definite. Dr. Halvorson asked Dr. Heidelberger to explain the tremendous increase in antibody after the second and third injection. Dr. Heidelberger stated that it was difficult to picture the exact mechanisms, but if antibody has already been formed, any antigen introduced is removed and transported more quickly and efficiently to the cells that form globulin. He pointed out that particulate antigens are better than soluble ones. Dr. Halvorson asked why all the antibodies should appear in the globulin fraction, and none in the albumin. Dr. Heidelberger replied by referring to the work of Dr. Florence Sabin, who suggested that globulins are secreted as a surface film from the cells of the reticulo-endothelial system in the liver, spleen and lymph nodes. Antigen introduced into the blood stream is phagocytized by these cells. This has been shown by the introduction of dye-antigen, in which case the colored antigen can be seen in the reticulo-endothelial cells. These cells apparently first split the dye from the protein molecule. It appears possible that the antigen molecules then affect subsequent globulin production in these cells.

Dr. Ellis asked if dye antigen localizes at all in the skin, and Dr. Heidelberger stated that it does not, unless it has been injected into the skin. Dr. Henrici pointed out that there is some evidence that in trichophytosis there occurs an actual sensitization of the epithelial cells, and that possibly one should not therefore generalize regarding the reticulo-endothelial cells being the site of all antibody reactions. Dr. Heidelberger replied that it would be highly desirable to study intracellular antibodies but that this is technically a difficult problem. The relative distribution of antibodies in the tissue juices and in the blood stream would be interesting. He has found that

rabbits may contain as much as 6 to 9 milligrams of antibody nitrogen per c.c. of serum, indicating that from $\frac{2}{3}$ to $\frac{3}{4}$ of the total globulin may actually be antibody in extreme cases.

Dr. Heidelberger asked Dr. R. A. Gortner his opinion regarding the role of salts in immunity reactions, whether he still believes that agglutination and precipitation occur in two phases—a preliminary combination of the antigen and antibody, followed by a precipitation due to the effect of an electrolyte on colloids. Dr. Gortner replied that this was still his opinion, and asked what other mechanism could be proposed to explain the actual flocculation. Dr. Heidelberger admitted that the antigen and antibody are combined in the absence of salts, but believed that there was another explanation for the influence of salt upon flocculation. He believes that agglutination and precipitation reactions represent a mutual interaction of multivalent compounds, namely the antigen and the antibodies. These combine to form large aggregates. In the absence of electrolytes, this reaction is limited by the accumulation of Coulomb forces due to the many ionized groupings on the forming aggregate. The presence of salt provides an ionic atmosphere which abolishes these forces and tends to allow the formation of large aggregates.

Dr. Gortner replied that such a phenomenon is essentially a coacervation between the antigen and the antibody, separating a liquid phase. Dr. Heidelberger replied that he considers the agglutination to be a purely chemical reaction from start to finish, and that the reduction of surface potential is merely a by-phenomenon. To support this he related an experiment in which type I pneumococci were added to excess of specific serum. The organisms were agglutinated as very fine aggregates which did not settle. The bacteria were then centrifuged and washed with salt solution until no antibody could be detected in the supernatant fluid. They were then re-suspended in salt solution, and the suspension was divided into two parts. One part was allowed to stand, and the organisms were found to remain in suspension. To the second part,

more type I pneumococci were added, and it was now found that complete agglutination took place. Dr. Heidelberger believes that with an excess of antibody the chemical reaction is interrupted in an early stage. If now we add an excess of bacteria, the new bacteria become linked to free side chains on the previously treated bacteria, and large aggregates are formed. It was found that if to the previously treated type I pneumococci one adds a nonspecific antigen, that is, type II pneumococci, no agglutination takes place. Dr. Heidelberger believes that this indicates that the reaction is a chemical one.

Dr. Gortner admitted that the phenomenon of *specificity* was the primary stumbling block to a purely colloid-chemical interpretation of the antigen-antibody reactions since colloid chemical reactions are ordinarily not highly specific, depending as they do purely upon surface forces. On the other hand, he insisted that one could not wholly ignore colloid surface behavior in immunity reaction, since to do so would be to set such reactions apart as a wholly separate class and to assume that the colloidal systems which are present no longer show the characteristic behavior which such systems should exhibit. The proper interpretation and the greatest chance for advancement of knowledge, in his opinion, lies somewhere in the middle ground between (1) specific chemical (or physical) reactions which are determined wholly by the nature and probably as well by the location in space, (on the surface) of reacting groups (e.g. $-\text{NH}_2$, $-\text{COOH}$, etc. etc.) and thus bring about specific and induced space orientation of the reacting micelles; and (2) the physico-chemical behavior characteristic of lyophilic colloid systems in general. Since electrolytes do profoundly affect the electrokinetic potential and lyophilic colloid hydration in the most diverse types of systems, they must contribute something to the net result of agglomeration and flocculation in the phenomenon of agglutination of bacteria. The big problem to which colloid chemistry cannot as yet contribute the answer is that of *specificity*. To answer that problem we will have to use all the tools and ingenuity we possess!



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